UNDERSTANDING THE COGNITIVE PROCESSES OF PROBLEM DETECTION AND DECISION MAKING AMONG ASSISTED LIVING CAREGIVERS

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UNDERSTANDING THE COGNITIVE PROCESSES OF PROBLEM DETECTION AND DECISION MAKING AMONG ASSISTED LIVING CAREGIVERS

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SUMMARY

Caregiving in Assisted Living Settings

It is estimated that by 2050 the proportion of older adults in the U.S. will reach 20% (U.S. Census Bureau, 2008). This increase in the older population will likely be associated with a greater need for supportive services in various sectors, including healthcare and housing. Many older adults choose to reside in assisted living communities due to increased difficulty managing health conditions or performing activities of daily living (e.g., bathing, toileting, walking; Mitzner, Chen, Kemp, & Rogers, 2013). A primary goal of assisted living communities is to help residents maintain their health and well-being. One method by which this is accomplished is that staff monitor residents for cues that might signal problems or concerns, and then respond appropriately. However, little is known about the decision making process of these caregivers.

Open Questions and Approach

The current study aimed to answer the following research questions:

[R1] What are the various cues interpreted by workers in assisted living?

[R2] What types of explanations do workers have regarding resident health and well-being issues, and how are these linked to cues that are noticed?

[R3] What actions do workers take to manage concerns about resident health and well-being?

[R4] What facets of knowledge are involved in the process of decision making?

[R5] How do the cues, explanations, responses, and facets of knowledge vary (a) between workers with a low level of experience in the job and workers with a high level of experience in the job; and (b) within each experience group?

These questions were addressed using a combination of methods. The first phase of the study employed a Critical Incident Interview method. The primary goal was to solicit a range of incidents from participants' personal histories characterized by a concern about a resident's health or well-being. The second component of the study was a Scenario-based Interview. This technique incorporated a series of hypothetical care situations that were systematically designed to differ in a number of characteristics. Because the same scenarios were used with all participants, this allowed for comparison of responses across experience levels as well as within each experience group.

Findings

Participants shared a range of cues they had experienced, and the majority of these cues were categorized as Cognitive, Physical, or Emotional in nature. Participants reacted with concern to most of the scenarios, although the ratings they assigned to indicate their level of concern showed a high level of variability across participants. The explanations participants generated for the various scenarios were classified as either general or specific, with the majority of explanations coded as specific. Specific explanations were primarily that the situation was the result of a Cognitive/Emotional/Social issue or a Physical health issue. Of the actions participants described taking to handle the scenarios, gathering and using information was discussed far more than any other action. Participants discussed needing information related to the resident, such as their health, current and recent state, and personal history, as well as

elaboration of the cues that initiated the concern in the first place, such as how long the symptom had been present. Participants also discussed various types of knowledge that they used in their decision making process. The most frequently discussed type of knowledge was health conditions and symptoms.

Lastly, the data from the current study did not generally reveal differences between the two levels of experience that were examined (≤16 months vs. 3+ years). It is possible that greater experience does not result in decision making gains because caregivers may not be receiving feedback, which is a necessary component of gaining expertise. However, it is also possible experience differences were not detected due to methodological constraints, including not taking other sources of experience into consideration, such as employment in related fields, education, or personal experiences. Therefore, two relevant areas for future research include a more inclusive consideration of experience, as well as exploration of what type of feedback caregivers typically receive.

The findings from the present study have been incorporated into a revised model of caregiver decision making. Practical implications of this research include concrete examples of cues that may serve as guidelines for formal and informal caregivers. Caregiver information needs were identified, which may be used to find ways to better support information gathering, such as through the use of technology. Additionally, caregiver training may be improved by implementing immediate feedback that highlights relationships between cues, underlying causes, and appropriate responses. As research continues in this area, our understanding of how caregivers in assisted living and other fields of long-term care make decisions will continue to grow.

CHAPTER 1

INTRODUCTION

The aging of the population is increasingly apparent in the United States. In 2010, approximately 38.6 million individuals, or 12.7% of the U.S. population, were 65 years old and over (U.S. Census Bureau, 2010). It is estimated that by 2050 the proportion of older adults in the U.S. will increase to 20% (U.S. Census Bureau, 2008). Older adults may reside in different forms of housing, including living in their own home or apartment, residing with family members, or choosing a long-term care community (e.g., independent living, assisted living, or nursing home).

How individuals or their families select a particular form of supportive housing may depend on a number of factors, including personal preferences and financial resources, but one of the primary forces is the extent of an older adult's care needs. A recent study reported that 38% of residents living in residential care facilities received assistance with three or more activities of daily living (ADLs), 36% received assistance with one to two ADLs, and only 26% received no ADL assistance (Caffrey et al., 2012).

In addition to ADL assistance, many older adults require help with instrumental activities of daily living (IADLs), many of which are associated with managing chronic health conditions. Recent estimates suggest that approximately 80% of older adults have at least one chronic condition, and 50% have at least two (CDC, 2009). Among older adults residing in residential care communities, the most common the 10 most common chronic conditions included high blood pressure, Alzheimer's disease or other dementias, heart disease, depression, arthritis, osteoporosis, diabetes, chronic obstructive pulmonary

disease and allied conditions, cancer, and stroke (Caffrey et al., 2012). Recent reports have also documented that 50% of residential care community residents had been diagnosed with 2-3 of these chronic conditions, and 26% had been diagnosed with 4-10 (Caffrey et al., 2012).

A primary goal of long-term care communities, such as assisted living, is to help residents maintain their health and well-being. This requires that staff continually monitor residents for cues that might signal problems or concerns, and then respond appropriately. The staff members who may be in a prime position to accomplish this task are the direct care workers who typically interact with residents the most, and who may have extensive knowledge about residents that facilitates the detection of problems.

The Context of Assisted Living

Long-term care communities have become a popular option for older adults who want to maintain a sense of independence but still receive some level of assistance. Assisted living communities are often viewed as occupying a middle ground between receiving care at home from informal or formal caregivers and admission to a nursing home, which is typically considered a last resort. Formal definitions of assisted living vary widely. Namazi and Chafetz (2001) identified 50 different definitions of assisted living facilities from various federal, state, and local authorities, as well as from researchers or interest groups. This variation is partly due to the fact that regulation of assisted living varies from state to state, but is also influenced by the numerous philosophies regarding what assisted living "should be".

Some suggest that assisted living came into existence as a reaction against nursing homes (Eckert, Carder, Morgan, Frankowski, & Roth, 2009). These advocates wanted to

create a setting that included a homelike living environment, was built on respect for residents' privacy, choices, independence, dignity, and individuality. This approach to assisted living has often been referred to as a "social model" of care, in contrast to the "medical model" of care that was associated with nursing homes and focused primarily on a person's medical diagnosis and treatment.

Perhaps as part of the rejection of the "medical model", there has been disagreement regarding the extent to which assisted living should be responsible for addressing the health care needs of residents (Hawes & Phillips, 2007). This view suggests that consumers should be responsible for making decisions and arrangements related to their health, and that this independence is a core component of the "social model" of care on which assisted living was founded.

However, others have argued that even if assisted living communities are not providing medical services or skilled nursing care, they should and often are still an important player in residents' health care and health promotion as a means of managing decline in residents' health and well-being (Ball et al., 2004). This view argues that the primary goal of older adult residents and the assisted living community in which they reside should be to manage declines related to health and well-being. Nunnelee and Gilliland (2001) proposed that the assisted living community should be invested in "health promotion, prevention of illness and injury, maintenance of function, and prevention and exacerbation of the residents' chronic conditions in order to avoid residents' transfer to a nursing home or a hospital after a short-term stay at an ALF [assisted living facility]" (p. 50).

To achieve the goal of assisting residents to maintain function and manage their health, assisted living communities employ a variety of staff. A recent report of the number of full-time equivalent employees working in residential care communities estimated that 10.2% were licensed practical or vocational nurses, 7.6% registered nurses, and 82.1% of the nursing staff in their sample were unlicensed nursing or resident care aides (i.e., direct care workers; Harris-Kojetin, Sengupta, Park-Lee, & Valverde, 2013).

On the Front Lines of Assisted Living: Direct Care Workers

A key player in assisted living communities is the direct care worker who is on the forefront of providing care and support to residents. These workers interact with residents, sometimes quite intensively, and often develop a relationship and sense of familiarity with them. When asked what they find most satisfying about their jobs, the majority of direct care workers (65%) said "the residents" (Kemp, Ball, Hollingsworth, & Lepore, 2010). Workers described many of their relationships with residents as "close", "personal", and "family-like", although they also acknowledged that not all resident relationships could be described this positively.

One study of direct care workers in residential care communities found that these aides spent eight times the number of hours per resident per day compared to registered nurses (i.e., 2.16 hours compared to .27 hours; Harris-Kojetin, Sengupta, Park-Lee, & Valverde, 2013). Due to the time spent and level of familiarity they can potentially develop with residents, these workers are in a position to detect changes in resident function and health that may be treatable and therefore critical to optimizing care and quality of life. Whether this actually occurs may be related to the knowledge that workers acquire.

These workers tend to have minimal training, although the regulations vary from state to state. Hawes, Phillips, and Rose (2000) found that for unlicensed direct care workers, 75% were required to attend some type of pre-service training or orientation. The amount of training required was typically between one and 16 hours, and only 11% completed this training before the start of work. Most training tends to include a period of "shadowing" a more experienced worker (Ball, Hollingsworth, & Lepore, 2010a).

Cognitive Skill Associated with Caregiving

The underlying premise of this dissertation is that workers in assisted living engage in the cognitive process depicted in Figure 2. The first phase of the process is problem detection, which describes how a worker interprets cues to arouse a concern regarding a resident's well-being. In the decision making phase, the worker chooses a response or multiple responses as a means of handling the concern regarding the resident. Each of these phases is heavily influenced by knowledge of the worker.

Charness and Schultetus (1999) defined knowledge as "acquired information that can be activated in a timely fashion in order to generate an appropriate response" (p. 61). The construct of knowledge has also been refined to include a psychological distinction between declarative (knowing what) and procedural knowledge (knowing how) (Anderson, 1982). This conceptualization of declarative knowledge fits well with the role of knowledge depicted in Figure 1 (i.e., the green circles). Workers in assisted living may have and apply various facets of knowledge, such as their knowledge of resident specific traits (e.g., Mrs. Smith reads the newspaper every morning), health-related knowledge (e.g., symptoms of a stroke), and aging-related knowledge (i.e., older adults are at a greater risk for falls). Workers may also draw up previous cases or incidents

from their experience in the process of detecting problems and making decisions regarding concerns about residents. Additional facets of knowledge that are relevant to this process may also exist.

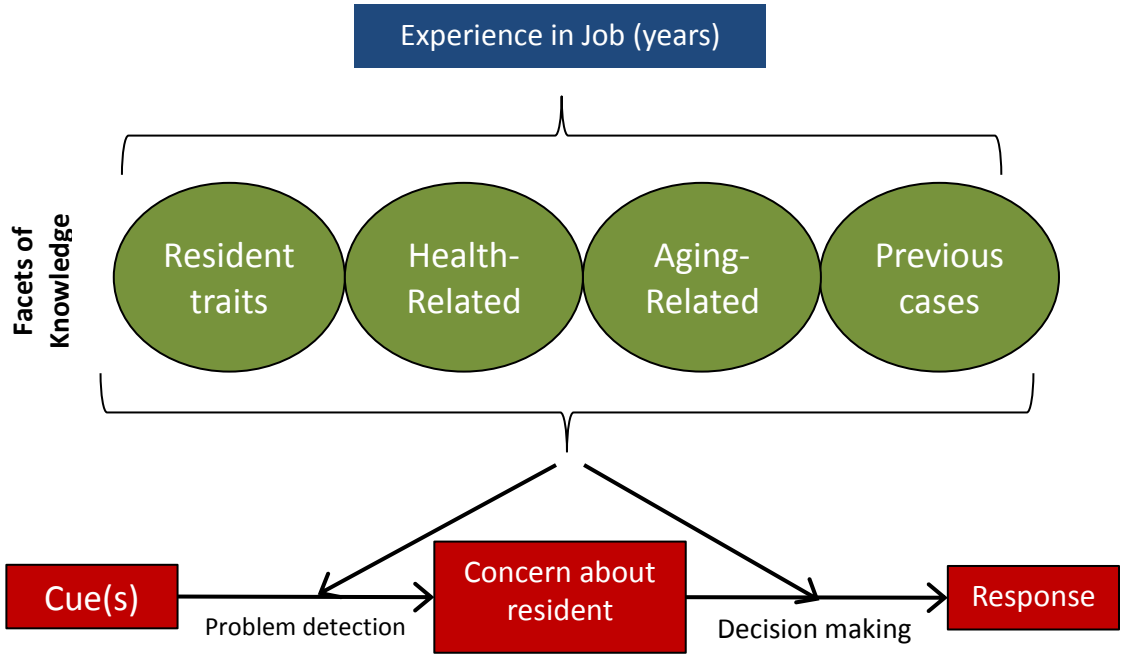

Figure 1. Depiction of the cognitive process workers in assisted living may engage in to manage resident well-being.

Domain knowledge has been shown to increase as a function of experience or expertise. Therefore, the cognitive process depicted in Figure 2 is also viewed as a complex cognitive skill, such that individuals may be more or less proficient at detecting resident problems and making appropriate decisions, and that proficiency is dependent on their domain knowledge, both in terms of knowledge content and organization. Approaches to studying skill acquisition and expertise have recognized the value of comparing novices to experts as a means of understanding how experts became that way

so that others can become more skilled and knowledgeable (Chi, 2006; Rogers, Maurer, Salas, & Fisk, 1997).

Problem Detection

Detecting actual or potential problems with residents is the first necessary step towards mitigating such problems. Detecting problems early on can often lead to more timely and effective solutions, whereas failures or delays in the detection of certain problems may exacerbate their consequences dramatically. For instance, the efficacy of stroke treatment depends largely on how soon treatment is administered after the first symptoms are detected. Klein, Pliske, Crandall, and Woods (2005) referred to problem detection as the "initial discovery that events are taking an unacceptable trajectory and may require action" (p. 14).

Klein et al. (2005) provided an illustrative case study of problem detection. The case study centered on two nurses working in an intensive care unit; one nurse was more experienced and serving as the instructor for the other, much less experienced nurse. The experienced nurse described how she noticed a baby's skin color was off, which prompted her to examine the baby's chart and also notice several other cues that signaled the baby was in distress. When the more experienced nurse asked the less experienced nurse how she thought the baby was doing, her response was only that the baby looked kind of sleepy. The experienced nurse also described how the less experienced nurse reported she had noticed one of the relevant cues (the baby's temperature dropping), but had responded by raising the incubator temperature, rather than seeing the pattern and trying to figure out *why* the baby's temperature was dropping.

These two nurses had access to the same cues, but interpreted them very differently. Klein et al.'s (2005) conceptualization of problem detection emphasized that experience drives one to notice and interpret such cues, which may allow for the detection of patterns that fit with an existing explanatory scheme. In other words, it is not just connecting the dots, but understanding what *is* a dot and what *is not* in the first place.

Klein (1999) contended that experience allows individuals to see things that may be invisible to others with less experience or expertise. Individuals with experience have a sense of typicality that lends itself to noticing patterns and relationships between cues that are often overlooked by those lacking such experience. Therefore a critical cue or set of cues, such as those described in the nursing case study above, would be attended to differently based on a person's domain experience. In addition to the presence of cues, Klein (1999) suggested that the *absence* of cues or events (also referred to as negative cues) is noticed by experts but not novices. Because novices lack experience they struggle to form expectancies, and without expectancies, they often fail to appreciate the significance of something *not* occurring.

Decision Making

Once a worker has discovered something of concern regarding a resident's well-being, the worker then engages in a decision making process to determine what course of action to take in response to the concern. One of the most influential lines of decision making research was published by Tversky and Kahneman (1974). Their perspective focused on how making decisions under uncertainty is often subject to cognitive biases as a result of heuristics (i.e., mental shortcuts) gone awry. One of the primary ways in which people were shown to be poor decision makers was by comparing their decisions

or judgments against statistical models or rules. For example, Tversky and Kahneman described how people, even "experts", were often insensitive to the prior probability of outcomes when evaluating the likelihood of events.

A more recent perspective of decision making, naturalistic decision making, has focused on understanding how experts have superior decision making skills compared to novices, particularly in complex, ill-structured settings characterized by time pressure and high stakes (Klein, 2008; Lipshitz, Klein, Orasanu, & Salas, 2001; Zsambok & Klein, 1997). This line of research has demonstrated that skilled decision makers spend most of their time sizing up the situation rather than comparing alternative courses of action (Salas & Klein, 2001). More specially, individuals with experience will make decisions using situation-action matching rules of the form 'Do X because it is appropriate for situation Y', rather than generating and evaluating multiple choices against each other.

These two perspectives on decision making may appear to be at odds, but Kahneman and Klein (2009) explored how it is that professionals' decisions are sometimes highly accurate and other times flawed. The two primary factors determining the quality of decision making are the predictability of the environment in which the judgment is made, as well as the individual's opportunity to learn the predictable relationships between events in the environment. This second factor corresponds to the concept of feedback (a critical component of deliberate practice) as discussed in the skill acquisition and expertise literature (Ericsson & Charness, 1994; Lewandowsky & Thomas, 2009).

Although these are useful models of decision making to consider, we will turn to a broader conceptualization of the decision making process that is not necessarily

concerned with failures or successes. Carroll and Johnson (1990) described the temporal stages of the decision making process as recognition, formulation, alternative generation, information search, judgment or choice, action, and feedback. The early stages of recognition and formulation correspond to Klein et al.'s (2005) concept of problem detection discussed previously, wherein the individual realizes there is a decision to make and classifies the decision problem. Alternative generation encompasses the process of hypothesizing why the situation may be occurring, which is followed by the gathering of information that is then used to judge and choose among the alternatives.

The last two stages included are action and feedback, also referred to as "decision taking". Here again the role of feedback is highlighted, as Carroll and Johnson (1990) described, "after decisions have been acted upon, the decision maker may receive information about the outcomes of the action. This permits learning – that is, changes in substantive knowledge and decision rules" (p. 24).

Decision Making in Long-Term Care Settings

Various investigations have explored how nurses use their knowledge and experience to detect cues, make clinical assessments, and make decisions (Cesna & Mosier, 2005; Cioffi, 2012; Crandall & Getchell-Reiter, 1993; Currey & Botti, 2003; Kazi, Pop, Durso, Ryan, & Cunningham, 2011). What *is* new is the perspective that workers in assisted living, who typically have very limited training and education compared to registered nurses, may also engage in similar cognitive processes. There may be qualitative differences, such as the level of specificity that is reached. For instance, because workers in assisted living do not have clinical training comparable to registered nurses, their interpretation of cues may not result in a diagnosis, but may be

more vague, such as a concern that "something is wrong". This assessment, while less specific, is still the necessary first step towards taking appropriate action if needed. Therefore, understanding how workers in assisted living make decisions is a worthwhile endeavor.

One related line of research was reported by Tingström, Milberg, and Sund-Levander (2010) and Sund-Levander and Tingström (2013). Described in these two papers was a study of nursing assistants who were employed by a community care organization that provided nursing home care and home health care. More specifically, the aim of Tingström, Milberg, and Sund-Levander's (2010) work was to explore nursing assistants' perceptions of signs and symptoms of infection among older adult care recipients. Through focus groups, they identified that signs of infection generally fell into two categories that they labeled 'person is not as usual' and 'person seems ill'.

Signs categorized as 'person is not as usual' included residents exhibiting discomfort, lack of inhibition, aggression, restlessness, confusion, tiredness, and decreased eating. The category of 'person seems ill' contained both general and specific signs of illness, as well as pain. The authors concluded that the range of cues detected by nursing assistants is evidence of their keen observational ability, although they also admitted that the validity of the mentioned cues remains to be confirmed.

In a follow up to their original study, Sund-Levander and Tingström (2013) described nursing assistants' clinical decision making process. Their model of nursing assistant decision making, which is based in part on Carroll and Johnson's (1990) model, is presented in Figure 2. Although many components of Carroll and Johnson's model are retained, certain stages, such as alternative generation and judgment/choice have been

removed without a clear explanation of why. New additions to the model expand upon the concept of information search into the various strategies used to gather and evaluate information, as well as what other factors influence what action is ultimately selected.

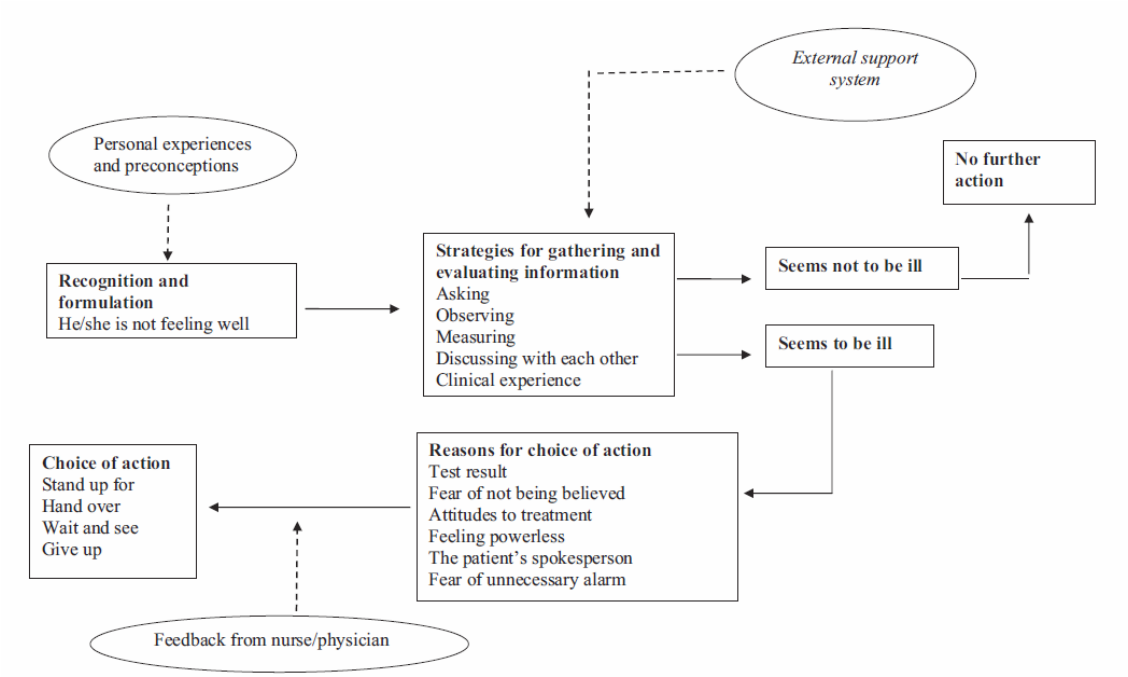

Figure 2. Sund-Levander & Tingström's (2013) model of nursing assistants' clinical decision making process.

Work by Hawes, Phillips, and Rose (2000) investigated whether assisted living staff correctly interpreted various symptoms or cues, such as incontinence, as not part of normal aging and cause for concern, a task similar to the problem detection process described previously. They found that the majority of staff, which included direct care workers as well as administrators and supervisors, had extensive misconceptions regarding normal aging. Figure 3 depicts that the majority of staff believed confusion, incontinence, depression, and anger to be typical of normal aging. Only 8% of the staff indicated none of these systems was part of normal aging.

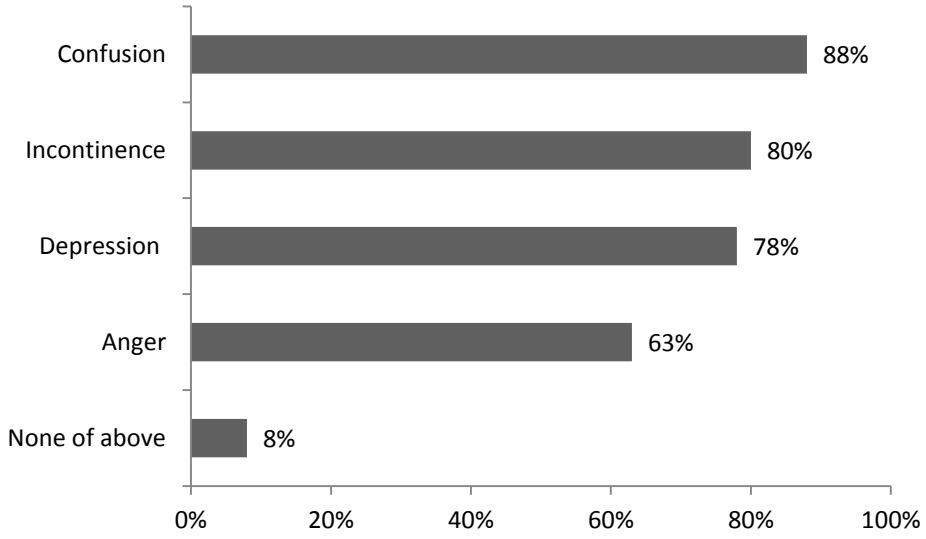

Figure 3. Percent of staff who viewed item as being associated with normal aging, adapted from Hawes, Phillips, and Rose (2000).

It is difficult to interpret these data given that they were not divided by job type or by experience level, which are both likely to have an impact on an individual's level of knowledge. Further, although this study indicated gaps in staff's knowledge of aging, which may impede effective problem detection, it failed to highlight what other facets of knowledge are relevant due to the use of pre-defined categories of knowledge. Using a more open-ended approach to examining worker knowledge in assisted living would be informative.

Similarly, research on workers' decision making in assisted living has focused primarily on the final outcomes, rather than the factors such as knowledge, that influence the decision making process. For instance, direct care workers from nursing homes and assisted living communities were asked in a focus group setting how they would respond to a resident fall episode (Phillips, Roberts, & Hunsaker, 2008). Although all participants stated they would contact a supervisor and examine the resident for injury, there were

differences between workers from assisted living and nursing homes in terms of additional responses, such as moving the resident or informing family members of the fall. Thus there was variability in the decisions made between workers in assisted living and nursing homes, although it is unclear why these differences exist and how these decisions were arrived at.

Experience likely plays a role; however this may have been obfuscated by the use of a focus group format. It is possible that less experienced workers agreed with more experienced workers, rather than expressing their own views. An additional aspect of the study was the focus on a resident fall, which can be considered a highly salient cue and one that requires minimal interpretation to result in a very specific concern about the resident. This scenario is qualitatively different from a situation in which cues may be subtle, require experience and knowledge to interpret, and result in a vague, but still useful concern about a resident's well-being.

In another study of worker decision making, staff in assisted living communities were provided with "care vignettes" that described relatively common problems in caregiving (Hawes, Phillips, & Rose, 2000). Each vignette offered a set of potential responses and staff had to either choose the best answer or all that applied, depending on the vignette. For certain care situations, there was a high level of consistency and accuracy across responses. For example, 95% of staff reported that if a resident developed hives after starting a new antibiotic, the resident's physician needed to be contacted. Similarly, 90% of staff indicated a physician's appointment was needed if a resident exhibited a recent onset of urinary incontinence.

However, 15% of respondents also indicated that a resident with incontinence should cut back on the amount of liquids consumed, an approach that could result in other problems such as dehydration. These responses indicate that a subset of the staff may not have the appropriate knowledge regarding urinary incontinence. It may be the case that so many individuals correctly stated they would contact a physician because that it is an organizational norm or standard, not because they truly understand that urinary incontinence may be symptomatic of other, treatable problems.

Hawes et al.'s (2000) study also failed to address how individuals use their knowledge to arrive at the care decisions in question. Further, the study participants were given a pre-determined set of care vignettes and a set of response options to choose from, with very little opportunity for staff to describe what other relevant decisions they may have made, or why they made the choices they did. Finally, the study did not consider how responses might vary by job type (e.g., direct care worker vs. supervisor), or by experience.

The relevance of worker knowledge to caregiving has been identified in several studies. An example provided by Kontos, Miller, & Mitchell (2010) described a resident who was terrified of taking a shower and screamed whenever the workers attempted to bathe her. The workers learned that this particular resident's fear of showers was linked to memories of the gas showers used during the Holocaust, of which she was a concentration camp survivor. With this knowledge they were able to adjust her bathing process, giving her a bath instead and greatly reducing her anxiety. The workers in Kontos et al.'s (2010) study also expressed that a lack of knowledge negatively impacts residents' well-being. Many studies have found a correlation between staffing levels and

measures of quality in nursing homes (see Bostick, Rantz, Flesner, & Riggs, 2006), and the workers in Kontos et al.'s (2010) study suggested that adequate and consistent staffing allowed them to develop relationships with residents, and that these relationships promote familiarity and knowledge of resident preferences that positively influence resident outcomes.

The research on worker knowledge in assisted living and nursing home settings has examined knowledge at a high level, often with the goal of measuring how much knowledge workers have in various categories. The role of knowledge in decision making specifically has been largely overlooked. For instance, in an effort to quantify the level of knowledge of workers in assisted living communities and nursing homes, Anderson, Taha, and Hosier (2009) asked nursing assistants from assisted living and nursing homes to rate how knowledgeable they were about their residents in a number of categories. These categories of knowledge included the: a) resident's life and occupation before admission, b) resident's family, c) resident's taste and interests, and d) resident's medical condition and care plan. Participants responded using a scale of 1 = very well, 2 = well, 3 = some, and 4 = not at all.

The data indicate that there is wide variability in the level of knowledge held by nursing assistants in assisted living and nursing homes (see Table 1). Knowledge about resident tastes and interest appears to be highest with the majority of responses indicating "very well" or "well", whereas knowledge about resident life and occupation, and family members tended to receive ratings of "some" or "not at all". Unfortunately, these data were not further divided to reveal whether difference exist between nursing assistants in

assisted living versus nursing home settings, or whether differences exist based on workers' level of experience.

Table 1

Nursing Assistant Knowledge Levels Adapted from Anderson, Taha, and Hosier (2009)

	Response (%)			
Knowledge Category	Very Well	Well	Some	Not at All
Life and Occupation	12.8	17.7	33.3	36.2
Family Members	13.5	22.0	39.0	25.5
Tastes and Interests	26.2	29.8	34.0	9.9
Medical Condition and Care Plan	17.0	34.8	26.6	13.5

Although it is useful to attempt to quantify knowledge levels in this way, Anderson et al.'s (2009) study contained several limitations. In terms of their methodology, it is not clear if the study participants answered the set of questions repeatedly for each resident for whom they provided care, or if they only answered the set of questions once, thereby requiring them to compute an average answer across the multiple residents they care for. Many workers in assisted living are caring for a large number of residents, estimated as high as a ratio of 14:1 in a large national sample of assisted living communities (Hawes, Phillips, & Rose, 2000). Previous research has demonstrated that workers may form close relationships with certain residents, but not others, potentially leading to high levels of variability in knowledge across residents (Bowers, Esmond, & Jacobson, 2000). Therefore, the knowledge ratings given by workers may not give the most accurate representation of their knowledge for each of their residents.

Further, by restricting their questioning to the pre-defined categories of knowledge, Anderson et al. (2009) imposed constraints that limited their ability to learn about other types of relevant knowledge. Lastly, research on rating scales has demonstrated that the numeric values included in scales such as the one used by Anderson et al. (2009), can impact how respondents interpret the scale labels, leading to significant changes in response behavior (Schwarz, Knäuper, Hippler, & Noelle-Neumann, 1991). Given that the numeric scale and the attached labels were matched poorly (i.e., increasing levels of knowledge were mapped onto decreasing numeric values), it is possible this may have skewed participants' results.

Open Questions

The cognitive processes of detecting problems and deciding on appropriate responses are used by individuals in many dynamic task situations (Klein et al., 2005; Zsambok & Klein, 1997). These processes are an essential aspect of caregiving in assisted living settings, but have yet to be fully investigated. Subtle changes in resident well-being, both cognitive and physical, may serve as cues to the direct care workers who spend the most time with assisted living residents that there is something to be concerned about.

Previous research has examined what responses workers choose when faced with resident concerns or issues (Hawes, Phillips, & Rose, 2000). However, this research is limited both in terms of the number of studies that have examined it, and also by the design choice to provide a set of responses to participants rather than letting them answer freely. Therefore, our understanding of the range of responses that may be used in various caregiving situations is lacking. The only research that has examined the cues

workers detect and interpret as part of the caregiving process was restricted to indicators of infection specifically (Tingström, Milberg, & Sund-Levander, 2010).

Although knowledge has been examined in the context of assisted living, the focus has been on measuring how much knowledge various types of staff have. Several of the studies have simply asked staff members of varying job types to discuss, rate, or answer questions designed to assess their level of knowledge in several pre-defined categories of declarative knowledge (e.g., resident's care plan). Many of these studies have been fraught with methodological limitations that constrain the applicability of these data. For instance, several studies have used a close-ended format in which participants chose among alternative responses, rather than supplying an unprompted answer.

Further, this research has not focused on knowledge as it relates to psychological processes, but rather on the task of caregiving broadly defined. What knowledge is used in the decision making of caregivers who are trying to maintain resident well-being? An additional limitation of previous research on assisted living is that very often workers are examined as a group, rather than by examining them as a function of experience. There is evidence that the content and organization of knowledge changes as a function of expertise and experience (Chi, 2006). How does knowledge used in problem detection and decision making processes vary between workers with less experience and workers with more experience?

Based upon the gaps present in the literature, the research questions for this dissertation were the following:

[R1] What are the various cues interpreted by workers in assisted living?

[R2] What types of explanations do workers have regarding resident health and well-being issues, and how are these linked to cues?

[R3] What actions do workers take to manage concerns about resident health and well-being?

[R4] What facets of knowledge are involved in the processes of decision making?

[R5] How do the cues, explanations, responses, and facets of knowledge vary (1) between workers with a low level of experience in the job and workers with a high level of experience in the job; and (2) within each experience group?

In this dissertation I proposed to answer these research questions using a variety of techniques. The study consisted of multiple qualitative interview methods and quantitative assessments. The interview techniques that were used fall under the classification of knowledge elicitation methods. Knowledge elicitation has been defined as "a process in which a worker is scaffolded in generating descriptions of his or her domain knowledge and reasoning" (Hoffman, 2008, p. 1). This scaffolding is oftentimes necessary because although individuals with expertise have vast domain knowledge, it may be difficult for them to verbalize their knowledge (Chervinskaya & Wasserman, 2000).

The first phase of the study was a Critical Incident Interview technique. The primary goal of this portion of the study was to solicit a range of incidents from participants' personal experience that involved decision making. The second component of the study was a Scenario-based Interview. Using this technique, I presented all participants with a series of hypothetical care situations that systematically differed on a

number of characteristics. Using the same set of scenarios across participants allowed for comparison of their responses across experience levels but also within each experience group. This provided valuable information regarding the variability and consistency of responses across participants.

CHAPTER 2

METHOD

Participants

Thirty-two direct care workers were recruited to participate in the study. These participants were grouped by experience working in assisted living, with half of the participants belonging to the high experience group, and the other half belonging to the low experience group. All participants were currently employed as a direct care worker in an assisted living community for older adults. Study participation lasted a maximum of 2.5 hours and participants were compensated monetarily for their time.[1] Participants' demographic information is presented in Table 2. Additional information on participant experience, education, and job duties is provided in the Results section.

Table 2

Participant Demographic Information

	Experience Level	
	Low (N = 16)	High (N = 16)
Age: *M (SD)*	29.63 (11.95)	39.88 (12.75)
Gender: *% (N)*		
Male	6% (1)	6% (1)
Female	94% (15)	94% (15)
Education: *% (N)*		
High school graduate/GED	12.5% (2)	37.5% (6)
Vocational training	6% (1)	19% (3)
Some college/ Associate's degree	69% (11)	31% (5)
Bachelor's degree	12.5% (2)	12.5% (2)
Ethnicity: *% (N)*		
Hispanic	12.5% (2)	--
Non-Hispanic White	12.5% (2)	94% (15)
Non-Hispanic Black	75% (12)	6% (1)

[1] 16 participants received $35, 16 participants received $50. This adjustment was made midway through data collection due to recruitment challenges.

Selection Criteria

Two primary determinants of eligibility were used for the study; (a) the individual's experience working in assisted living with older adults, and (b) characteristics related to their current employment. Experience in assisted living was operationally defined as the total time (e.g., years, months) spent working in assisted living facilities, including their current job. In a recent study of Georgia direct care workers (Ball & Perkins, 2010), experience at one's current facility averaged 2.5 years (*SD* =2.7), and overall experience in long-term care (not limited to assisted living) averaged 7.8 years (*SD* = 7.4). On the basis of these data, low experience participants were required to have between 1 and 16 months of experience. High experience participants were required to have 3 or more years of experience.

Regarding their current employment status, participants must have been working at least 20 hours per week as a direct care worker in assisted living. A recent study of 400 direct care workers in Georgia found that the median number of hours worked per week to be 36, therefore full-time status (i.e., 40 hours per week) was not required (Lepore, Ball, Perkins, & Kemp, 2010). Due to the limited interaction with residents, individuals who only work during the overnight shift were excluded from participating. Some assisted living facilities include memory care or dementia units; individuals working solely in these units were not eligible for participation due to the specialized nature of their training and the fact that interactions with these resident populations are likely to be qualitatively different in nature from the general resident population. Further, the workers had to be employed by the assisted living facility itself, not by an outside agency (e.g., home health agency). This exclusionary criteria was necessary because the

training of these individuals may differ from the facility's workers, and the responses of outside workers to any given care situation may have also differed markedly as well (e.g., report it to the agency supervisor rather than the assisted living facility supervisor).

Recruitment

A list of assisted living facilities was generated using a database managed by the Georgia Department of Community Health, Healthcare Facility Regulation Division. The database was searched for communities listed as Personal Care Homes and Assisted Living Facilities located in the Atlanta metropolitan area. Once these facilities were identified, a multi-pronged recruitment approach was used.

The facility administration was contacted and the purpose of the project explained. If the facility was interested, recruitment materials were distributed to the direct care workers that described the nature of the project and what workers' involvement would entail. In some cases, the experimenter was able to speak with the direct care workers at staff meetings or during shift changes. In these instances, if workers indicated potential interest, their name and telephone number were requested for a follow-up recruitment phone call.

In addition to this approach, an advertisement for the research study was placed on the Atlanta Craigslist.org website that included the same information as the recruitment materials that were distributed at the facilities. Individuals interested in participating were screened for the criteria relating to their experience in assisted living and current job characteristics (see Appendix A for the Screening Script).

Materials

Interview Script

The interview script consisted of two primary components; the critical incident interview and the scenario-based interview. The full interview script is provided in Appendix B.

Critical Incident Interview

This interview approach was derived from the critical decision method described by Klein, Calderwood, and MacGregor (1989). This method uses a set of probes to study the cognitive bases of judgment and decision making in naturalistic settings with individuals of varying levels of expertise or experience. The information that is solicited may include goals during the incident, cue utilization, response options that were generated, evaluated, or chosen, and other contextual elements (Crandall & Getchell-Reiter, 1993). This methodology has been successfully used in numerous studies across various professional fields, ranging from fireground command (Klein, Calderwood, Clinton-Cirocco, 1986) to nursing in neonatal intensive care units (Crandall & Getchell-Reiter, 1993).

Participants were asked to recall specific incidents during which they experienced concern for a resident's health or well-being. In addition to describing the incident, participants were asked about the specific conditions surrounding the event, including what caused them to become concerned, what their concern was, and how they responded to the concern. Additional questions were asked to probe into what facets of knowledge were drawn upon during the incident to enable them to interpret the cues and respond to the concern.

Next, participants were asked to recall any incidents in which an issue that negatively affected a resident's health or well-being was present, but they failed to handle the issue appropriately, perhaps because they failed to detect the relevant cues, misinterpreted the cues, or responded to the issue inappropriately. These types of incidents have been probed for in previous studies using the critical decision method. For instance, nurses in a neonatal intensive care unit were asked to recall incidents in which they incorrectly suspected that an infant was septic, as well as incidents in which an infant became septic and it was not detected (Crandall & Getchell-Reiter, 1993). Additionally, participants were asked to recall incidents in which a caregiver besides themselves failed to respond to a resident issue appropriately.

Scenario-Based Interview

This interview method employed a set of scenarios that were used for all of the participants. It provided a basis for comparison across all participants and across the two experience groups that would not have been possible with the Critical Incident Interview due to the variability of the reported incidents. This method also provided the researcher control in terms of the content of the scenarios.

Seven scenarios were used to represent hypothetical residents exhibiting a range of behaviors and symptoms. Each scenario was presented to the participant and served as the basis of discussion for a series of interview questions designed to elicit how the participants would interpret and respond to these cues presented in the scenario. The scenarios used during this portion of the interview are presented in Table 3.

Table 3

Scenario Descriptions

Scenario	**# of cues**	**Cue type**	**Scenario Text**
Dinner Complaint	1	Behavior	*Neutral scenario* : Mr./Mrs. Harris sits down for dinner and complains that he/she does not like the entrée being served that evening. [*This scenario will be female for half of the participants, and male for the other half of participants.*]
Incontinence	1	Physical	While helping Mrs. Brown get undressed, you notice she has wet her pants.
Forgotten Conversation	1	Cognitive	Mr. Clark forgets a conversation he had with you from yesterday.
Trouble Walking-Dizziness	2	Physical Physical	You notice that Mrs. Anderson is having some difficulty walking and appears to be dizzy.
Crossword Trouble-Confused Speech	2	Cognitive Cognitive	Mr. Smith is having trouble doing his crossword puzzle. Today he has also had times when what he says does not make a lot of sense, and other times when he seems fine.
Cough-Confusion	2	Physical Cognitive	Mrs. Edwards has a cough, and seems to be confused about where she is.
Isolation-Withdrawal from Activity	2	General Behavior	You notice that Mr. Johnson is not coming out of his room and he skips out on his regular activities and hobbies.

The goal of scenario development was to create scenarios that included cues that were subtle and non-specific enough that they could relate to numerous health/well-being issues that commonly occur among older adults. Further, the cues presented in each scenario ranged both in terms of type and number. Some of the scenarios presented only a single cue, others included two cues. Several of the cues were physical in nature, whereas others were related to the cognitive functioning of the hypothetical resident, and the cues in one scenario depicted behavior.

The cues were selected because they could be considered likely or commonly occurring among an assisted living population. Further, the scenarios were developed without including an explicit mention of how long the cue had been present (e.g., "starting last week") or whether the cue was atypical for the resident. This placed the onus on the participant to consider that the cue may mean different things depending upon whether this is the first occurrence or a repeated issue for the resident.

The first scenario depicted in Table 3, Dinner Complaint, was included in an effort to reduce the demand characteristics that might be present in the Scenario-based Interview. It was designed to represent a relatively innocuous situation that was not expected to warrant concern from participants, setting the stage for them to feel comfortable responding without concern to the remaining scenarios. Many participants responded as expected to this scenario, but because approximately half of the participant sample did express some level of concern and answered the follow-up interview questions, the data from this scenario were included in analysis. The subject of the neutral scenario was female for half of the participants and male for the other half of participants.

The remaining six scenarios were written so that half included males and the other half included females.

After each scenario was presented, participants were asked whether the hypothetical scenario would cause them to be concerned. If they responded affirmatively, they were asked to provide a numerical value to indicate how serious their concern would be (see Appendix C for rating scale). The remaining interview questions assessed participants' interpretation of the scenario, whether they would seek additional information, what actions might be taken in response to their concern, and what facets of knowledge were used during these judgments and decisions.

Demographic and Experience Questionnaire

The demographics section of the questionnaire was adapted from a pre-existing Demographic and Health Questionnaire (Czaja et al., 2006). It gathered information such as participants' age, gender, level of education, and ethnicity. The job duties and experience section of the questionnaire was used to document participants' job experience, current job duties, resident assignment, certifications, training, and continuing education. These data were used to describe the participant sample. See Appendix D for the Demographics and Experience Questionnaire.

Knowledge of Aging Questionnaire

To assess participants' knowledge about characteristics of "normal" aging, a measure of aging and health conditions common among older adults was developed. The assessment was based on Towner's (2006) Self-Assessment of Geriatric Knowledge, which is a 50-item multiple choice assessment derived from the American Association of Colleges of Nursing's recommended geriatric competencies for individuals holding a

Bachelor of Science in Nursing. Due to the comparatively lower anticipated education of the current study participants, the assessment was reduced to 24 items, with questions relating to advanced nursing topics removed. The final version of the Knowledge of Aging Questionnaire is in Appendix E.

To reduce negative feelings participants may have experienced due to the potential difficulty of the questionnaire, it was introduced as being under development. The cover page of the questionnaire described that the experimenter was seeking the participant's input on how to improve the questionnaire, and any feedback on which questions were irrelevant, confusing, or too difficult would be appreciated. This was also communicated verbally by the experimenter before the questionnaire was administered.[2]

Equipment

The interview portions of the study were digitally recorded. Following the interview, these audio files were transferred to a computer and renamed using the appropriate participant identification code.

Procedure

After giving informed consent, the goals of the study were discussed with participants and any questions were answered by the interviewer. The interviewer began the Critical Incident Interview by asking participants to recall incidents in which they were concerned about a resident in his/her care, and each incident was discussed. This procedure was repeated for all the incidents the participant reported, or until 30 minutes had passed. At that point, the interviewer asked participants to describe incidents in

[2] Data analysis revealed low performance on this assessment for both experience groups (percent correct for the low experience M=30.47, SD=11.86; high experience M=31.51, SD=13.52). Additionally, a split-half reliability analysis produced a Spearman-Brown coefficient of .53 (.80 is considered reliable). Therefore, these questionnaire data will not be discussed in the Results section.

which resident issues were not responded to appropriately. The same procedure was used as above, except with a different set of interview questions. These types of incidents were discussed for a maximum of 10 minutes. If the participant could not recount an incident to discuss, the interviewer continued on to the Scenario-based Interview.

To avoid the risk that the content of the scenarios could potentially influence the type of incidents the participant recalled, the Scenario-based Interview was always conducted after the Critical Incident Interview. To begin the Scenario-based Interview, participants were told that they would be given a hypothetical situation describing an older adult living in assisted living. A printed version of the scenario was placed in front of the participant and remained there for the duration of the discussion for that scenario. The scenario was also read aloud by the interviewer. The interviewer then followed the interview script. This procedure was repeated for each of the scenarios.

The order in which scenarios were presented was counterbalanced, except for the first scenario, which was always the Dinner Complaint (neutral) scenario. The remaining six scenarios were counterbalanced using pseudo random orders (see Appendix F). A list of random orders was generated and then reduced to a final set of eight orders using two criteria: 1) No more than two scenarios with two cues (i.e., physical-physical) could occur in a row, and 2) Each scenario must be presented in the first and last position at least once. Each order was used twice within each experience group.

Following completion of the interview portion of the study, participants completed the Demographic and Experience Questionnaire, followed by the Knowledge of Aging Questionnaire. Upon completion, participants were debriefed, compensated, and thanked. See Figure 4 for an overview of the study procedure.

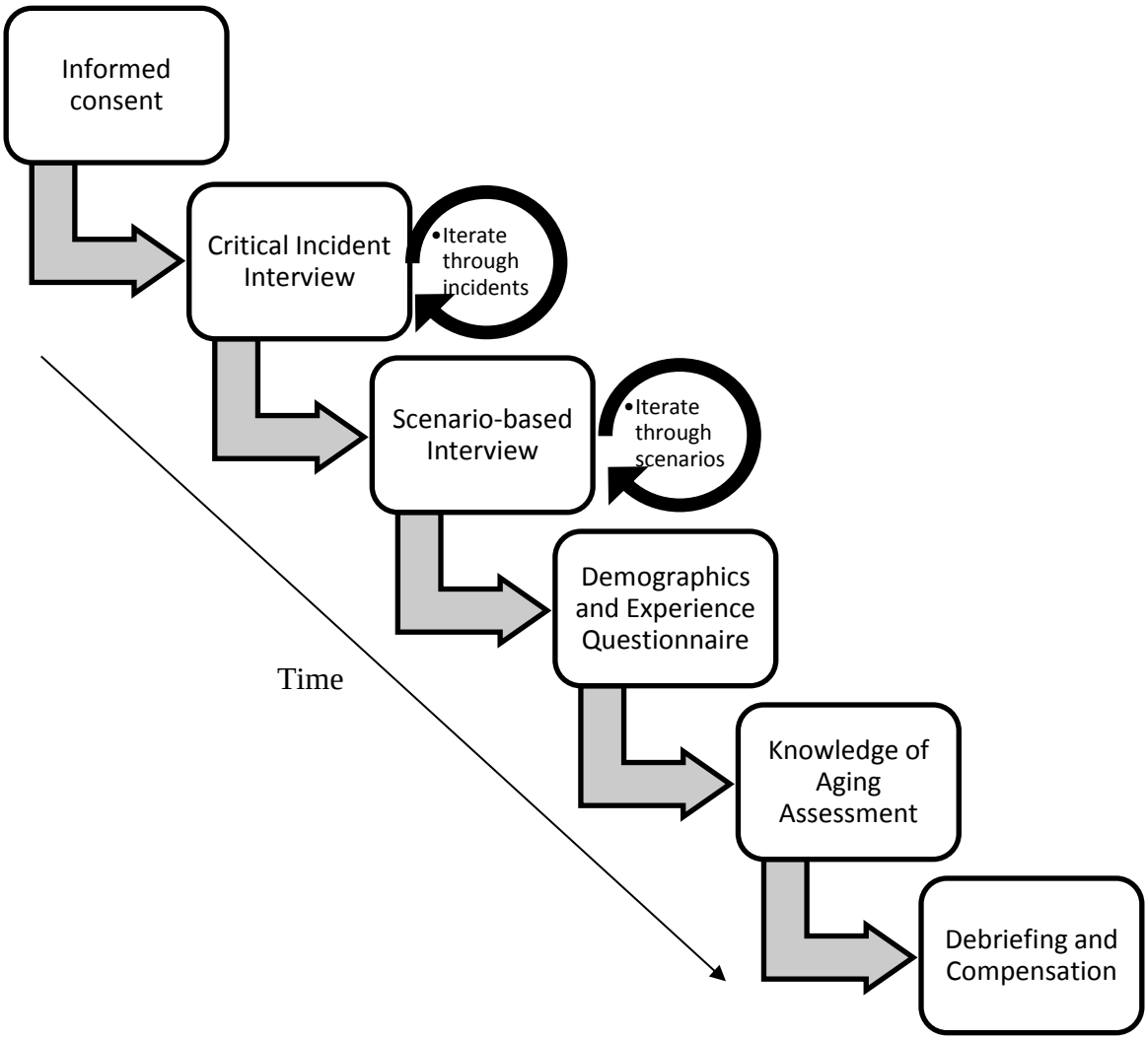

Figure 4. Timeline of the study procedure.

CHAPTER 3

RESULTS

Experience, Training, and Job Characteristics

Data from the Demographic and Experience Questionnaire provided insight into the sample's work experience, training, and job responsibilities. Participants' experience working in assisted living and related fields of long-term care is presented in Table 4. The average amount of time working in assisted living, including current and previous employment, was just over eight months for low experience participants and approximately 8 years for high experience participants. Participants reported experience working with and caring for older adults in a number of other settings, such as home health care and nursing homes.

Table 4

Participant Experience in Assisted Living and Related Fields

	Experience Level	
	Low	High
Time worked in assisted living		
Mean	8.31 months	7.83 years
Minimum	2 months	3 years
Maximum	16 months	17.58 years
Current or previous employment (% reporting 'Yes')		
Home health care	56%	88%
Hospice care	6%	13%
Nursing home/skilled nursing	19%	38%
Retirement community	6%	25%
Senior day care/Senior center	13%	19%

The training and educational background of participants were also assessed (see Table 5). The majority of participants were certified nursing assistants, and a substantial portion also held certifications as medical assistants (coded as Other). One quarter of the high experience participants were also certified medication technicians. All low experience participants reported being required to attend some manner of orientation at their current facility before beginning work, whereas 12% of high experience participants reported not being required to complete an orientation. The length of this orientation was most often 2-5 work days, although a third of low experience participants reported their orientation was as short as a single work day. Although duration was captured in the questionnaire, the nature of how the orientation was delivered was not documented.

Table 5

Participant Certification and Training

	Experience Level	
	Low	High
Certifications/Licenses		
Certified Nursing Assistant	81%	75%
Certified Medication Technician	--	25%
Other	44%	31%
None	6%	13%
Orientation required (% reporting 'Yes')	100%	88%
Length of orientation		
Half of a work day	19%	13%
1 full work day	31%	6%
2-5 work days	44%	69%
6 or more work days	6%	6%

Characteristics of participants' jobs as caregivers are presented in Table 6. On average, low experience participants reported they worked approximately 43 hours per week. Although this average is higher than high experience participants' mean

Table 6

Participant Job Characteristics and Duties

	Experience Level	
	Low	High
Hours worked/week: *M (SD)*	42.77 (28.93)	33.84 (8.68)
Shift worked during the last 7 days?		
Day shift (e.g., 7am-3pm)	56%	75%
Evening shift (e.g., 3pm-11pm)	44%	44%
Night shift (e.g., 11pm-7am)	6%	19%
Other (e.g.,	13%	6%
What shift during the last 2 months?		
Day shift (e.g., 7am-3pm)	56%	63%
Evening shift (e.g., 3pm-11pm)	31%	50%
Night shift (e.g., 11pm-7am)	--	19%
Other	13%	6%
How many residents assigned? *M (SD)*	16.00 (7.09)	12.10 (2.93)
Same or different residents?		
Same residents	69%	63%
Residents change	19%	19%
Combination	13%	19%
Regular duties (% reporting 'Yes')		
Assisting residents getting to places outside of the facility (e.g., drive or escort residents)	31%	50%
Assisting residents with social or recreational activities	75%	100%
Clerical tasks or bookkeeping	25%	44%
Companionship (e.g., chatting, social support)	88%	88%
Cooking	25%	38%
Light housekeeping (e.g., wash dishes or make beds)	94%	88%
Heavy cleaning (e.g., vacuum or mop floors)	25%	56%
Laundry	94%	94%
Passing out medication or assisting residents with self-administration of medication	38%	69%
Provide personal care of residents (e.g., help with bathing, dressing, using the toilet, walking)	88%	100%
Serving meals	94%	100%

number of hours worked per week, the low experience group contained one participant who lived in his place of work and cared for its residents 24 hours a day, 6 days a week. When his data were removed, the low experience group's average dropped to 35.54 hours, similar to the high experience participants.

In this sample, the majority of participants reported primarily working the day shift or evening shift, which was expected given that caregivers who primarily worked during the night shift were excluded from participation. Participants reported that they typically cared for between 12-16 residents during their shift, and in most cases participants were assigned to the same residents.

The bottom portion of Table 6 depicts the percentage of participants who regularly engaged in various facility duties. The duties with the highest number of participants responding 'Yes' included serving meals, providing personal care, laundry, light housekeeping, companionship, and assisting residents with social or recreational activities. 2 of the low experience participants reported they did not provide personal care to residents, such as assistance with bathing, dressing, and other activities of daily living. However, the job titles provided by these two participants (caregiver and resident caregiver), suggesting that they did interact with residents, but perhaps more so as a companion possibly because the residents to which they were assigned did not need assistance with personal care.

High experience participants were more likely to assist with medication administration, which may be explained in part by the fact that a quarter of the high experience group were certified medication technicians compared to none in the low

experience group. However, this certification is not required to assist with medication administration, as both groups reported involvement in this task.

These data on participant experience, training, and job duties serve to establish a profile of the participants included in the current sample, as well as providing context for the remainder of the reported results.

The two portions of the structured interview (i.e., critical incident interview and scenario-based interview) were examined to answer the research questions put forth in this dissertation, which are outlined below:

- [R1] What are the various cues interpreted by workers in assisted living?
- [R2] What types of concerns do workers have regarding resident health and well-being issues, and how are these linked to cues?
- [R3] What is the range of responses workers use to manage concerns about resident health and well-being?
- [R4] What facets of knowledge are involved the processes of problem detection and decision making?
- [R5] How do the cues, concerns, responses, and facets of knowledge vary (1) between workers with a relatively low level of experience in the job and workers with a relatively high level of experience in the job; and (2) within each experience group?

Specifically, the critical incident interview results will be examined to answer [R1] and [R5] as they relate to cues, and the scenario-based interview will address [R2] though [R5].

Critical Incident Interview Results

Participants were asked to recall specific incidents during which they experienced concern for a resident's health or well-being. These incidents provided insight into how participants used cues present in their interactions with residents to detect and respond to concerns regarding resident well-being. To analyze these cues, the audio recordings of the critical incident interviews were first transcribed verbatim. The transcripts were divided among two coders who coded a unit of text anytime it contained reference to a cue. A cue was operationalized as anything that led caregivers to become concerned about the resident being described in the incident. These were primarily observations made by the participants, but in some cases were based upon information reported to the participant by a resident (e.g., "I'm in pain").

Coding of the transcripts was primarily data-driven; coding began with only high level categories (e.g., cognitive, emotional) that were subject to change as coding progressed. Each time a cue was identified in the transcript a new code was created to capture it, unless one already existed. After coding all transcripts, the full list of codes was examined. Similar codes were combined, and some codes were moved from one category to another. The final coding scheme can be found in Appendix G.

What Cues Facilitate Concern?

In total, participants described 222 cues across 61 incidents. All participants were able to describe at least one incident, even those with only a month or two of experience working in assisted living. An independent samples t-test did not yield a significant difference between the number of incidents reported by the low experience group (M = 1.81, SD = 1.11) and the high experience group (M = 2.00, SD = 1.03), t(30)

= -.50, p = .62, suggesting that encounters with residents resulting in concern were experienced enough by low experience participants that they were able to report a comparable number of incidents to high experience participants even though they had less time working to draw from.

Low and high experience participants reported a similar average of cues per incident (M = 4.08, SD = 2.68; M = 3.21, SD = 1.41, respectively), $t(30) = 1.14$, p = .26. Low experience participants, however, did demonstrate a numerically greater range of average cues per incident (2-12 cues), compared to high experience participants (1-6 cues). This may be a result of the recency of the incidents, which allowed low experience participants to recall the incident in greater detail.

Table 7

Cues Described by Participants During the Critical Incident Interview

		Experience Level		
		Low	High	**All**
General		6	5	11*
	Decline	3	0	3
	Sick/Not feeling well	0	1	1
	Other	3	4	7
Specific		119	92	211*
	Cognitive	20	9	29†
	Physical	64	62	126†
	Emotional	35	21	56

* $p < .05$ (i.e., category is significantly over or underrepresented)
† $p < .05$ (i.e., category is significantly over or underrepresented)

Participants' comments regarding what cues prompted them to become concerned were divided into General and Specific categories. General cues included comments made by participants that were vague in nature and described a change in the resident at a high level (e.g., she seemed sick) without reference to what was actually being observed.

Specific cues were coded as Cognitive, Physical, or Emotional. The distribution of cues is presented in Table 7.

To determine if participants relied more on General or Specific cues, a chi square goodness of fit test was conducted. There was a significant difference whereby General cues were underrepresented and Specific cues were overrepresented, χ^2 (1, N = 222) = 180.18, $p < .001$. Additionally, within Specific cues, Cognitive cues were underrepresented whereas Physical cues were overrepresented, χ^2 (2, N = 211) = 71.27, $p < .001$. It was thought that low experience participants may have struggled to describe the cues they encountered in specific terms, and instead relied on general perceptions of change or decline. However, chi square tests of independence demonstrated that neither the distribution of cues into the General and Specific categories (χ^2 (1, N = 222) = .02, p = .90) nor the distribution of cues into the three Specific subcategories (χ^2 (1, N = 211) = 4.32, p = .12) varied as a function of experience level.

The distribution of cues presented in Table 7 demonstrates that participants were capable of describing the cues they had previously witnessed in specific terms. Only 5% of the cues were described in general terms, including reports such as "…this particular day, I knew he was a little abnormal, the way he was acting." Overall, participants described an average of 3.64 cues per incident (SD = 2.15), further suggesting that they were able to recall the cues relevant to these events in detail rather than only recollecting a vague sense that something was wrong with the resident.

Due to the low frequency of General cues, this category will not be discussed further. Because the overwhelming majority of cues were described in specific terms, this category's sub-codes were examined in greater detail. Table 8 displays the cues

belonging to the Cognitive, Physical, and Emotional categories. Of these three categories, the Physical category contained the most reports of cues, followed by Emotional, then Cognitive. This could be indicative of the relative frequency of encountering these different cues in assisted living environments. However, it may also be the case that physical cues were both salient to observe and easier to recall.

Table 8

Specific Cue Categories and Sub-Codes

Cognitive (N = 29)	
	Confusion/Not alert
	Forgetting
	Psychotic symptoms
Physical (N = 126)	
	Abnormal urine
	Body Movement/posture
	Breathing
	Decreased appetite
	Difficulty speaking
	Eyes
	Fall
	Lethargy
	Pain
	Skin abnormality/temperature
	Sleep
	Standing up
	Trouble going to bathroom
	Wander/Attempt escape
	Unresponsive
	Other
Emotional (N = 56)	
	Combative/Aggressive/Agitated
	Non-compliant
	Depressed
	Unengaged/Subdued/Isolating

Cognitive cues included descriptions of residents appearing confused or disoriented, repeatedly forgetting things, or displaying psychotic symptoms, such as

hallucinations and paranoia. For example, one participant described a resident as, "She used to think that people were stealing random stuff…She would think that people would come in at night and take stuff."

The Physical category included cues that might be considered traditional medical symptoms as well as deviations from normal resident behavior. For example, this cue category included symptoms such as resident reports of pain, skin abnormalities (e.g., rash, swelling, bruising, sweating or clammy skin), urine that had an abnormal appearance or odor, and labored breathing. Deviations from typical behavior that were observed included decreased appetite, wandering or escape attempts, lethargy or lack of energy/activity, and sleep disturbances. Within this category, there were several cues that were mentioned only once; these were grouped into the Other category and included an array of cues that could not be grouped into any higher level category, such as vomiting, bleeding, dizziness, seizure, and bloating.

Cues categorized as Emotional were behaviors that were affective or attitudinal in nature. For example, one participant described a resident as, "He's combative, wanna fights you, wanna do nothing you ask him to do," depicting the resident as both combative and non-compliant. Participants also described residents as becoming unengaged, withdrawing from activities and interaction with other people, such as, "She just started to want to stay in her room all the time". Other cues were that a resident's general attitude or personality changed, often becoming more subdued, such as "she was really friendly to people and she just stopped."

The distribution of comments within each experience group warrants discussion as notable differences were observed. Within the low experience group, one participant

discussed five separate incidents, with an average of 7.20 cues per incident. Recall that the average number of cues per incident was 3.64. Her comments comprised 65% of the low experience group's Cognitive cues, and the remaining Cognitive cues were provided by only four participants. This same participant was responsible for 40% of the Emotional cues for the low group, with the remainder discussed by nine other low experience participants. Among the Physical cues, comments were more equally distributed among participants, with the maximum percentage of cues provided by a single participant at 16%, and a total of 13 participants providing cues for this category.

Within the high experience group, seven participants provided the nine Cognitive cues, 14 participants provided the 62 Physical cues, and 10 participants contributed to the 21 cues in the Emotional category. The highest number of cues provided by a single participant was 10 Physical cues by a participant who discussed four separate incidents.

Summary

The data from the Critical Incident Interview allowed me to examine a sampling of the type of cues that caregivers have encountered and interpreted as reason for concern about residents' health or well-being. Both low and high experience participants were capable of recollecting the cues that were associated with more than one incident, on average. Furthermore, the majority of cues discussed were specific in nature, rather than general or gist recollections that something with the resident was off or unusual. Among the specific cues discussed, the majority were classified as Physical, followed in frequency by cues classified as Emotional, and Cognitive. Low and high experience participants reported a similar number of cues in each of these categories, although the

distribution of reported cues among individual participants was more variable for the low experience group than the high experience group.

Scenario-based Interview Results

Research questions [R2]-[R5] were focused on understanding the explanations, actions and knowledge used in decision making, as well as how these components differed between and within low and high experience groups. The scenario-based interview data were examined to answer these questions. As a supplement to the participants' data, portions of the scenario-based interview were administered to a subject matter expert (SME) via an online survey (see Appendix H). The SME was a licensed practical nurse and had 43 years of experience working with older adults in an assisted living setting. This additional measure allowed comparison between what participants reported and what might be considered 'optimal' or 'correct'.

Specifically, the SME was presented with the same seven scenarios and asked to provide for each a) a rating of concern (using the same response scale as participants), b) the most likely and possible, but less likely, causes for the situation presented in each scenario, and c) a rating of how important it is that a caregiver (i.e., the study participants) engage in a subset of actions in response to the scenario. The SME's responses will be discussed where pertinent.

Segmentation and Coding Scheme Development

After transcribing the audio recordings, the next step was segmenting the transcribed data into meaningful units. A segment was defined as any utterance by participants describing a) their explanation of why the situation presented in each

scenario might be occurring, b) an action taken to handle the scenario in question, or c) a facet of knowledge that was relevant to understanding and handling the scenario.

Next, a coding scheme was developed to categorize the segments. The coding scheme contained three high level categories corresponding to the nature of the relevant research questions; namely, explanations, actions, and facets of knowledge. Within each of the categories, sub-codes were developed using both a data-driven approach and the existing literature. For example, many of the explanation sub-codes were created after being mentioned by participants, whereas many of the knowledge codes were included based on previous research on knowledge held by caregivers in long term care communities.

After the coding scheme was iteratively developed and appeared relatively complete, inter-coder agreement, or the degree of consistency among different coders, was calculated. A high level of inter-coder agreement ensured that the coding scheme was valid and well-defined, and was not limited to use by the individual who created it. To measure inter-coder agreement, a transcript was selected and coded independently by two coders using a qualitative data analysis software package called MAXQDA.

Following coding, percent agreement was calculated between the two coders and discrepancies were discussed, resulting in revisions to the coding scheme. This process was repeated a second time on a new transcript, at which point 81.2% inter-coder agreement was reached. Although there is no standard, Saldana (2012) reported that agreement between 80-90% seems a minimal benchmark. Therefore, at this point the remaining discrepancies were again discussed and the coding scheme revised, resulting in the final coding scheme that was used for the remainder of the transcripts. The remaining

coding was divided between two coders; one coder was responsible for approximately two-thirds of the remaining data, and the other coder one-third of the remaining data.

Concerns and Explanations

An understanding of the nature of concerns experienced, explanations generated, and how these were linked to cues presented in caregiver-resident interactions can be gleaned by examining several portions of the scenario-based interview. Participant concerns in response to the scenarios were investigated by a high level assessment of whether concern was present or not, a rating of participants' level of concern, and inquiry into the nature of participant concerns (i.e., what were their explanations for scenarios).

Presence of Concern

The first interview question that was posed after the presentation of each scenario asked participants to indicate whether the scenario would cause them concern about the resident. Participants' responses to this question were coded into one of two categories; "Yes/Depends" or "No". Yes/Depends includes responses in which the participant responded in the affirmative, as well as responses in which the participants described conditions that, if satisfied, would lead to concern.

For example, for the scenario in which a female resident has wet her pants, participants indicated they would be concerned if the resident was not someone who typically had incontinence problems, or if the resident had repeated instances of pants wetting rather than an isolated incident. If participants responded with "No", they were asked to explain why they were not concerned. The majority of their responses were either that a) the situation could be resolved easily, or b) the situation was a function of aging and therefore common among residents. These data are presented in Table 9.

Table 9

Presence of Concern Collapsed Across All Scenarios

	Experience Level		
	Low	High	**All**
Yes/Depends	93	95	188*
No	19	17	36*
Total	**112**	**112**	**224**

* $p < .05$ (i.e., category is significantly over or underrepresented)

To determine whether the two responses were reported equally, a chi square goodness of fit test was performed. Overall, participants reported that they would be concerned in response to the scenario more often than not, χ^2 (1, N = 224) = 103.14, p < .001. This finding is not surprising given that the scenarios were designed to elicit concern (except for the neutral scenario). However, it also reveals several participants indicated no concern, and more than would be expected if participants only responded with no concern to the neutral scenario (which would have been a maximum of 16 per experience group).

Additionally, a chi square test of independence was performed to examine whether the presence of concern varied between experience groups. Presence of concern did not differ across the low and high experience groups, χ^2 (1, N = 224) = .13, p = .72, suggesting that for this high level judgment, experience did not impact how many scenarios were reported as concerning by participants. Within each experience group, the distribution of responses was similar. Low experience participants on average rated 5.81 scenarios as eliciting concern (SD = 1.22), whereas high experience participants gave this rating to a mean of 5.94 scenarios (SD = 1.06).

Responses to the presence of concern interview question for each of the seven scenarios are presented in Table 10. A chi square test of independence was not conducted because the expected frequency of some cells was less than 5, which is the suggested minimum (Gravetter & Wallnau, 2004). However, the observed frequencies suggest that participants in the low and high experience groups were fairly consistent in terms of whether a scenario elicited concern or not. Participants in the high experience group expressed concern to the same extent or more than participants in the low experience group across scenarios except for the Crossword Trouble-Confused Speech scenario and the Isolation-Withdrawal from Activity scenarios. The Trouble Walking-Dizziness scenario elicited concern from all participants, whereas the Dinner Complaint scenario evoked the fewest indications of concern.

Table 10

Presence of Concern by Scenario and Experience Group

Scenario	**Response**			
	Yes/Depends		**No**	
	Low	High	Low	High
Dinner Complaint	6	8	10	8
Incontinence	13	14	3	2
Forgotten Conversation	11	12	5	4
Trouble Walking-Dizziness	16	16	0	0
Crossword Trouble-Confused Speech	16	14	0	2
Cough-Confusion	15	16	1	0
Isolation-Withdrawal from Activity	16	15	0	1

Rating of Concern

Participants who responded affirmatively to the initial question about concern were also asked to provide a rating of their level of concern (see Table 11 for median ratings). The scenarios eliciting the highest ratings of concern from participants were the Trouble Walking-Dizziness and Cough-Confusion scenarios. The most consistency across participants was observed for the Trouble Walking-Dizziness scenario; all low participants rated this 4 or higher and high participants rated it 3 or higher. For most of the remaining scenarios, there was a high level of variability of ratings.

Table 11

Frequency of Response for Concern Rating by Scenario

	Low Experience		**High Experience**		
Scenario	Median	Range	Median	Range	SME Rating
Dinner Complaint	3.00	2-4	2.50	2-4	1.0
Incontinence	3.00	2-5	3.00	2-4	1.0
Forgotten Conversation	3.00	2-5	3.00	2-4	2.0
Trouble Walking-Dizziness	4.00	4-5	4.50	3-5	5.0
Crossword Trouble-Confused Speech	2.50	2-4	3.00	2-5	3.0
Cough-Confusion	4.00	2-5	3.50	2-5	4.0
Isolation-Withdrawal from Activity	4.00	2-5	3.25	2-5	3.0

Note. Ratings can range from 1 (*not at all serious*) to 5 (*extremely serious*)

There were no significant differences between experience groups in their ratings of concern, according to non-parametric Mann-Whitney *U* tests conducted on the median rating for each scenario (see Appendix I for test statistics). The range of responses within

each experience group was identical for the Dinner Complaint, Cough-Confusion, and Isolation-Withdrawal from Activity scenarios. However, the low experience group had a higher maximum rating for the Incontinence and Forgotten Conversation scenarios although the median rating was the same as that of the high experience participants.

The SME's ratings of concern are also presented in Table 11. The degree of consistency between the SME and participants varied by scenario. The greatest mismatch was observed for the Incontinence scenarios, wherein both low and high experience participants displayed a higher median rating of concern (3 = moderately serious) compared to the SME (1 = not concerned at all). The scenario rated extremely serious by the SME, Trouble Walking-Dizziness, was the highest rated scenario for both experience groups, although the high experience group had the closet median rating of 4.5. These comparisons reveal that for some scenarios, the SME provided a higher rating of concern, and in others, the participants gave higher ratings.

Nature of the Concerns

After participant comments were coded as described in an earlier section, the number of comments in each high-level category was subjected to chi-square goodness of fit tests and chi square tests of independence to determine whether comments were equally distributed across categories and whether this varied as a function of experience. An alpha level of .05 was used for all statistical tests. To determine which cell or cells produced the statistically significant results, residuals (the difference between the observed frequency and the expected frequency) were converted to z-scores and compared to a critical value corresponding to an alpha of 0.05 (i.e., +/- 1.96).

Participants provided possible explanations for what was causing the behaviors and symptoms presented in each scenario. These explanations were coded as General, Specific, or Don't Know. General explanations included that the resident is sick, his/her general health is declining, or attributions to the aging process. Specific explanations included references to Cognitive/Emotional/Social issues (e.g., Alzheimer's disease, depression), Physical health issues (e.g., diabetes, stroke, urinary tract infection), or the resident's preference not being met. Both the General and Specific explanation categories included an Other code; explanations that were coded as Other will be discussed in relation to the specific scenario in which they arose. The full Explanation coding scheme can be found in Appendix J.

Table 12

Explanations Collapsed Across All Scenarios

		Experience Level		
		Low	High	**All**
General		25	40	65*
	Aging	3	12	15
	Health declining/Getting worse	5	3	8
	Not feeling well/sick	8	14	22
	Other	9	11	20
Specific		191	198	389*
	Cognitive/Emotional/Social issue	59	40	99
	Physical health issue	102	123	225†
	Resident preference not met	11	8	19†
	Other	19	27	46†
Don't Know		3	0	3*

*$p < .05$ (i.e., category is significantly over or underrepresented)
† $p < .05$ (i.e., category is significantly over or underrepresented)

The explanation code frequencies are presented in Table 12. A chi square goodness of fit test was performed to determine whether the proportion of General,

Specific, or Don't Know explanations was equal. General explanations and Don't Know responses were underrepresented, whereas Specific explanations were overrepresented, χ^2 (2, N = 457) = 564.15, $p < .001$. These data highlight that participants' explanations tended to be specific rather than general, and from examination of the frequencies within the table, the majority of the Specific explanations provided were focused on Physical health issues, although only three of the seven scenarios included a physical cue.

It was expected that low experience participants might more often use general explanations or simply state they did not know what was causing the situation, as a result of likely having fewer relevant experiences to draw from when generating possible explanations. A chi square test of independence revealed that explanation type (General vs. Specific) did not differ across experience groups, χ^2 (1, N = 454) = 2.53, p = .11, suggesting that low and high experience participants were producing general and specific explanations with similar frequencies.

Within each experience group, the number of General and Specific explanations provided by individual participants was examined. General explanations were provided by 12 low experience participants and 15 high experience participants. The number of General explanations provided ranged from 1-5 for low experience participants, and 1-6 for high experience participants. Specific explanations were provided by all participants except for one low experience participant. The number of Specific explanations provided ranged from 1-28 for low experience participants, and 6-25 for high experience participants.

Notably, only three participant responses were coded as Don't Know across all seven scenarios, and these three responses were made by three different participants

belonging to the low experience group. Zero participants from the high experience group responded with "Don't Know". Two of these responses were made in response to the Crossword Trouble-Confused Speech scenario, and one in response to the Incontinence scenario. Because the proportion of explanations that were coded as Don't Know was so low, these data will be not be included in the following analyses.

To determine if the distribution of sub-codes belonging to the General and Specific categories was equal within each respective category, chi square goodness of fit tests were conducted. The distribution of codes belong to the General category (e.g., Aging, etc.) did not differ significantly from an equal distribution, χ^2 (3, N = 65) = 7.19, p = .07. Conversely, among the Specific category sub-codes, explanations coded as Physical health issue were overrepresented, and Resident preference not met and Other codes were underrepresented, χ^2 (3, N = 389) = 257.82, $p < .001$. The overrepresentation of Physical health issue codes is not surprising given that they were applied for every scenario, and there was a wider range of Physical health issues that were discussed.

A chi square test of independence could not be conducted on the General explanation sub-codes due to cell size limitations, and results from a chi square test of independence on the Specific explanation sub-codes did not reach significance, χ^2 (3, N = 389) = 7.35, p = .06. Examination of the patterns, although not significant, does reveal that low experience participants appeared more likely to provide Cognitive/Emotional/Social issue explanations, whereas high experience participants more often discussed Physical health issue explanations.

Explanation by Scenario

The nature of the explanations for each of the seven scenarios provided information about whether participant explanations were sensitive to the varying cues presented in the scenarios. Chi square goodness of fit tests were conducted on each of the seven scenarios to determine if codes were equally distributed between the General and Specific explanation categories. The results of these tests were significant for all seven scenarios, and indicated that General explanations were underrepresented, whereas Specific codes were overrepresented. Therefore, the overall pattern discussed earlier in which Specific explanations were more likely than General explanations held for each of the seven individual scenarios. Interestingly, the ratio of General to Specific explanations did vary across scenarios, as can be seen in Table 13. This will be discussed within the respective scenario sections.

Additionally, chi square tests of independence were conducted on each of the seven scenarios to determine if the distribution of responses between General and Specific explanations varied as a function of experience. The cell size was too small for five scenarios, and for the two remaining scenarios significance was not reached. Because these findings were consistent across all scenarios, the results of the chi square goodness of fit tests and the chi square tests of independence are presented in Appendix K and L, respectively. Due to cell size limitations, chi square tests of independence could not be conducted on lower level codes to detect differences among the two experience groups. However, group differences are discussed for some scenarios where patterns differed.

Table 13

Explanation Code Frequency by Scenario

Code	Dinner Complaint	Incontinence	Forgotten Conversation	Trouble Walking-Dizziness	Crossword Trouble-Confused Speech	Cough-Confusion	Isolation-Withdrawal from Activity	All
General	1	5	10	6	7	6	30	**65**
Aging	0	5	6	2	1	1	0	**15**
Health declining/ getting worse	0	0	3	1	4	0	0	**8**
Not feeling well/ sick	1	0	1	2	1	4	13	**22**
Other	0	0	0	1	1	1	17	**20**
Specific	33	55	23	98	60	60	60	**389**
Cognitive/emotional/ social issue	4	11	12	1	27	11	33	**99**
Physical health issue	7	29	5	91	31	49	16	**225**
Resident preference not met	12	0	0	0	0	0	7	**19**
Other	10	16	6	6	2	0	4	**46**

Dinner Complaint

Only approximately half of participants expressed concern for this scenario, and the explanations they provided tended to center on the resident's preference not being met in terms of what the meal was or how the food was prepared. Participants made comments such as, "it might be something that he didn't want," and, "sometimes it'll be that they don't want it boiled." The Other category contained the next largest set of explanations, of which many dealt with the quality of the food itself being problematic (e.g., "maybe the food is nasty"). The explanations provided by the SME tended to be of this nature as well.

Table 14

Explanations for the Dinner Complaint Scenario

		Experience Level		
		Low	High	All
General		0	1	1*
	Aging	0	0	0
	Health declining/Getting worse	0	0	0
	Not feeling well/sick	0	1	1
	Other	0	0	0
Specific		17	16	33*
	Cognitive/Emotional/Social issue	2	2	4
	Physical health issue	1	6	7
	Resident preference not met	7	5	12
	Other	7	3	10

* $p < .05$ (i.e., category is significantly over or underrepresented)

One interesting difference between the explanations provided by the low and high experience groups is that the high experience group gave several explanations related to a Physical health issue, whereas the low experience group only provided this type of explanation once. Upon closer inspection, it was only two participants from the high

experience group who provided the six explanations categorized as a Physical health issue. One of these participants listed several gastrointestinal issues (e.g., diarrhea, constipation) that might be associated with not wanting to eat meals, and the other high experience participant mentioned that having a cold might also be responsible.

Incontinence

Explanations for the Incontinence scenario were primarily related to Physical health issues as well (see Figure 5). The majority of comments (N=18) were related to incontinence or a weakened bladder, rather than being an acute issue. As one participant described, "it could be that she's just becoming incontinent and doesn't know [that she wet herself] because that happens a lot in geriatrics". Interestingly, these types of comments do not necessarily explain why the episode of incontinence occurred, but essentially just rephrased the scenario.

Table 15

Explanations for the Incontinence Scenario

		Experience Level		
		Low	High	All
General		1	4	5*
	Aging	1	4	5
	Health declining/Getting worse	0	0	0
	Not feeling well/sick	0	0	0
	Other	0	0	0
Specific		30	25	55*
	Cognitive/Emotional/Social issue	7	4	11
	Physical health issue	17	12	29
	Resident preference not met	0	0	0
	Other	6	9	15

* $p < .05$ (i.e., category is significantly over or underrepresented)

Incontinence often has an underlying cause that can be treated in most cases, and these comments suggest that some participants may not recognize this. Six participants also mentioned the possibility of the resident having a urinary tract infection, and this was mentioned by an even number of low and high experience participants. Given that this is a common cause of temporary incontinence, it was surprising that it was not mentioned by more participants.

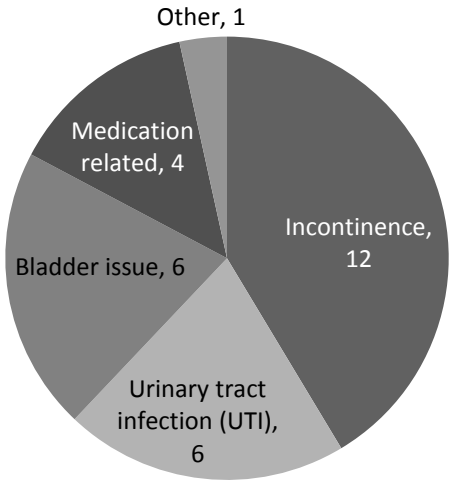

Figure 5. Frequency of explanations coded as Physical health issue for the Incontinence scenario.

Second to Physical health issues, the majority of explanations were coded into the Other category and described that the situation may have been an isolated event in which the resident had an accident due to being late to the bathroom. The SME's explanations for this scenario included the possibility of a urinary tract infection, failing to make it to the restroom in time, and forgetfulness or distraction. These were consistent with the frequently mentioned explanations provided by participants, except for the explanation

that participants provided regarding becoming incontinent, which was not mentioned by the SME, suggesting that the SME was more likely to search for specific causes rather than simply reframing the scenario as evidence of incontinence.

Although not the most frequently mentioned category, explanations coded as Cognitive/Emotional/Social issues were discussed by several participants (who were mostly from the low experience group). These explanations described that the episode of incontinence might have resulted from a resident feeling anxious, depressed, or even afraid, potentially as a result of abuse. Some of the explanations in this category also noted that incontinence may be related to Alzheimer's and dementia, in that the task of going to the restroom is one of the things that are often forgotten.

Of the five explanations of Aging, four of these explanations were made by high experience participants. These explanations attributed incontinence to the process of aging. Comments made by participants to this effect included, "I think it just happens as they get older. " Although it is true that incontinence is more common among older adults, it is not considered a normal part of aging. Lastly, one low experience participant responded with Don't Know, and was unable to offer any explanations for the scenario although this did express that it would be a concern.

Forgotten Conversation

In this scenario, the majority of explanations indicated a Cognitive/Emotional/Social issue, which was most often described as degraded memory, an isolated incident of forgetting, or associated with Alzheimer's disease/dementia (see Figure 6). Participant comments of this nature included, "In the back of your mind you're going to think early signs of dementia," and, "It could be as simple as they just

don't remember." The SME's explanations were consistent with participants' explanations. High experience participants also provided a few explanations related to physical health issues, including medication, fatigue, and urinary tract infection. One low experience participant also mentioned medication may be playing a role.

Table 16

Explanations for the Forgotten Conversation Scenario

		Experience Level		
		Low	High	All
General		3	7	10*
	Aging	1	5	6
	Health declining/Getting worse	2	1	3
	Not feeling well/sick	0	1	1
	Other	0	0	0
Specific		11	12	23*
	Cognitive/Emotional/Social issue	8	4	12
	Physical health issue	1	4	5
	Resident preference not met	0	0	0
	Other	2	4	6

* $p < .05$ (i.e., category is significantly over or underrepresented)

Overall, participants provided relatively few explanations for this scenario in comparison to the other scenarios, only 33. The only other scenario with a comparably low number of explanations was the Dinner Complaint scenario, which was intended to elicit little concern and therefore had far fewer participants providing explanations. Further, the ratio of General to Specific explanations was larger here than all other scenarios except for the Isolation-Withdrawal from Activity scenario. The Specific explanations were provided by six low experience participants and seven high experience participants. This suggests that although two-thirds of participants expressed concern for the present scenario, they provided fewer explanations as to why it might have been

occurring in specific terms, and in many cases attributed it to general age-related changes or declining health.

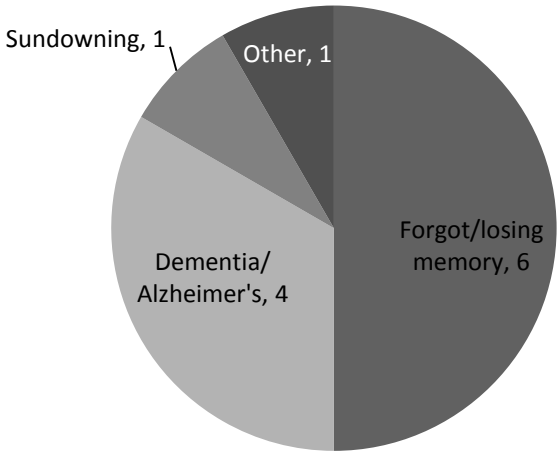

Figure 6. Frequency of explanations coded as Cognitive/Emotional/Social issue for the Forgotten Conversation scenario.

Trouble Walking-Dizziness

With respect to the scenario depicting a resident who appears dizzy and is having trouble walking, the majority of participants' explanations related to a Physical health issue (see Table 17). The distribution of physical health issues mentioned is presented in Figure 7. The most commonly mentioned explanation was that the dizziness and trouble walking were potentially related to medication, either in the form of a change in medication, new medication, or a missed dose. The next most discussed explanation category was hypertension and blood pressure, which was discussed by twice as many high experience participants than low. The next several most discussed explanations included lack of food and/or water, diabetes/blood sugar, injury, stroke, and getting up

too quickly. The Other category contained a high number of explanations, however there was little consistency among comments in this category. Included were mentions of too much exposure to the heat, being bothered by legs or feet, vertigo, cholesterol, low vision, ear problems, alcohol, heart issue, and a sinus infection. Regarding the distribution of explanations, for both low and high experience groups, the highest number of explanations provided by any single participant was six.

Table 17

Explanations for Trouble Walking-Dizziness Scenario

		Experience Level		
		Low	High	All
General		2	4	6*
	Aging	1	1	2
	Health declining/Getting worse	1	0	1
	Not feeling well/sick	0	2	2
	Other	0	1	1
Specific		50	48	98*
	Cognitive/Emotional/Social issue	1	0	1
	Physical health issue	47	44	91
	Resident preference not met	0	0	0
	Other	2	4	6

* $p < .05$ (i.e., category is significantly over or underrepresented)

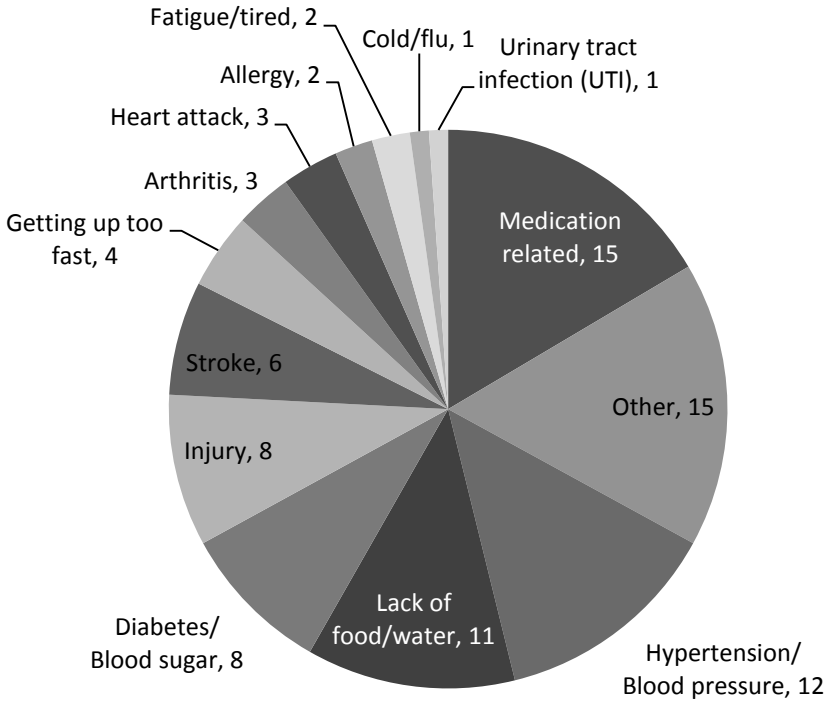

Figure 7. Frequency of participant explanations coded as Physical health issue for the Trouble Walking-Dizziness Scenario.

The explanations provided by the SME correspond to several of the explanations participants described within the Physical health issue category. However, the relative likelihood of these explanations varied between the SME and participants. Specifically, the SME described the *most likely* causes of this scenario to be stroke or blood pressure issues, and other possible causes included dehydration and blood sugar issues. Stroke and blood pressure were primarily mentioned by high experience participants, dehydration was mentioned approximately the same amount, and blood sugar issues was mentioned by mostly low experience participants.

Crossword Trouble-Confused Speech

Participants' explanations for this scenario were categorized primarily as Cognitive/Emotional/Social issue and Physical health issue. Explanations coded as Cognitive/Emotional/Social issue were predominantly related to Alzheimer's/dementia (see Figure 8). A smaller number of explanations suggested that the resident's memory was getting worse, which was unexpected given that the scenario did not explicitly contain any reference to memory problems. Each of these explanations were discussed by approximately the same number of low and high experience participants.

Table 18

Explanations for the Crossword Trouble-Confused Speech Scenario

		Experience Level		
		Low	High	All
General		3	4	7*
	Aging	0	1	1
	Health declining/Getting worse	2	2	4
	Not feeling well/sick	0	1	1
	Other	1	0	1
Specific		27	33	60*
	Cognitive/Emotional/Social issue	14	13	27
	Physical health issue	12	19	31
	Resident preference not met	0	0	0
	Other	1	1	2

* $p < .05$ (i.e., category is significantly over or underrepresented)

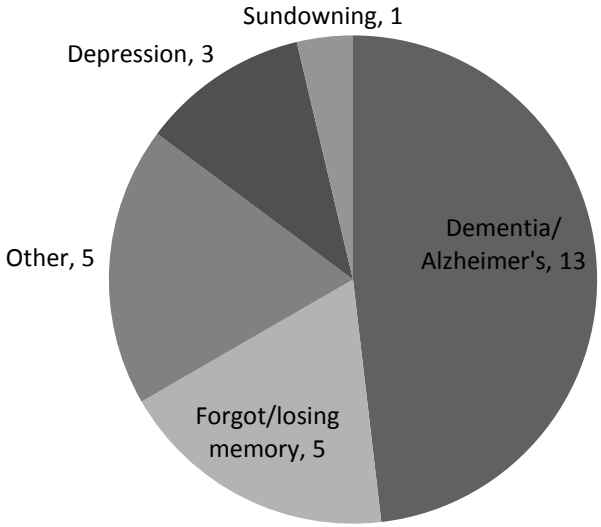

Figure 8. Frequency of participant explanations coded as Cognitive/Emotional/Social issue for the Crossword Trouble-Confused Speech scenario.

Of the explanations coded as Physical health issue, the majority were provided by ten high experience participants, and the remainder were discussed by six low experience participants (see Figure 9). Medication related issues and stroke were the two top discussed explanations, and were described by an equal number of low and high experience participants. Urinary tract infection was mentioned five times, with only one of those comments provided by a low experience participant. Low experience participants' explanations within Physical health issue were fewer in frequency and spanned fewer categories. Of the remaining physical health issues, diabetes/blood sugar, hypertension/blood pressure, cold/flu, and pneumonia were all provided by high experience participants only.

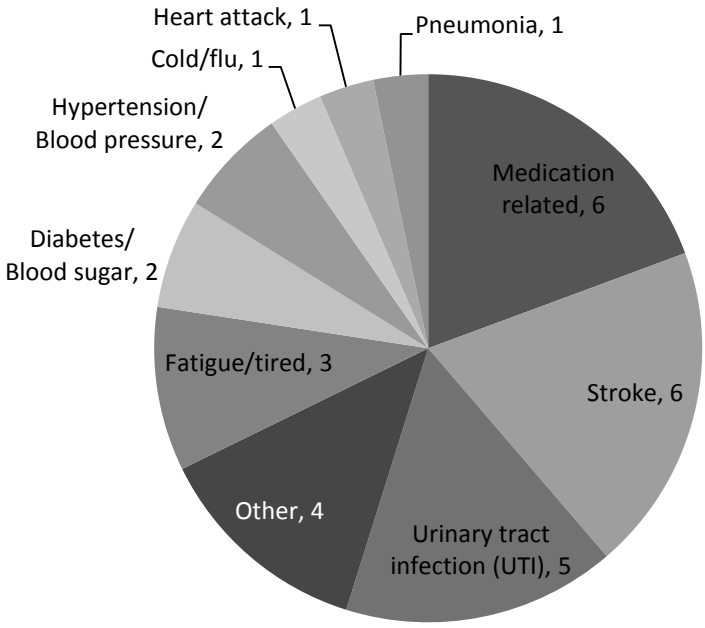

Figure 9. Frequency of participant explanations coded as Physical health issue for the Crossword Trouble-Confused Speech scenario.

The SME described the most likely explanations to be a urinary tract infection, medication side effects, fatigue, or distraction. This is the most consistent with high experience participants, although low experience participants also recognized the possible role of medication-related effects and fatigue.

Cough-Confusion

The explanations provided for this scenario tended to center on issues related to physical health (see Figure 10). The most frequently mentioned explanations were all some type of respiratory infection (i.e., cold/flu, pneumonia, bronchitis), suggesting that participants may have focused on the cough cue that was part of the scenario to a greater extent than the confusion cue. The next most discussed explanations were urinary tract infection and medication-related, which were only mentioned by high experience

participants, and were likely in reference to the confusion portion of the scenario. A number of unique explanations were coded as Other, including that the person is having trouble swallowing, asthma, lung cancer, sinus infection, and fever.

Table 19

Explanations for the Cough-Confusion Scenario

		Experience Level		
		Low	High	All
General		4	2	6*
	Aging	0	1	1
	Health declining/Getting worse	0	0	0
	Not feeling well/sick	3	1	4
	Other	1	0	1
Specific		27	33	60*
	Cognitive/Emotional/Social issue	7	4	11
	Physical health issue	20	29	49
	Resident preference not met	0	0	0
	Other	0	0	0

* $p < .05$ (i.e., category is significantly over or underrepresented)

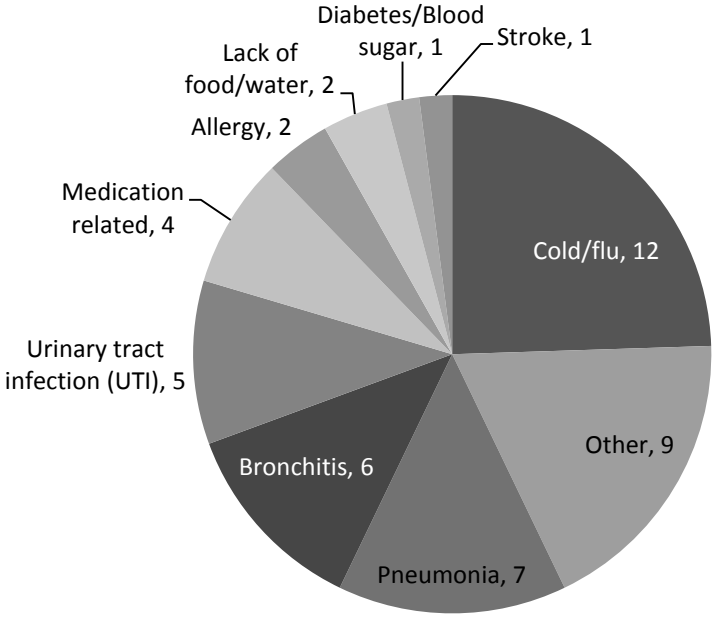

Figure 10. Frequency of participant explanations coded as Physical health issue for the Cough-Confusion scenario.

Some explanations were only mentioned by high experience participants, including urinary tract infection, medication-related issues, and stroke. High experience participants were also more likely to mention cold/flu as a potential explanation, whereas low experience participants more often mentioned pneumonia. Overall the physical health issue explanations were provided by eight low experience participants and 13 high experience participants.

The SME described that the most likely cause for this situation was that the resident might have a fever or other vital signs are abnormal. This is difficult to consider alongside the participants' explanations because the SME's explanation seem to be more of a description of co-occurring symptoms that might be present with many of the infections described above (e.g., cold/flu, pneumonia, bronchitis, urinary tract infection) rather than a stand-alone explanation. The SME also mentioned the resident's symptoms might be related to medication, which was only mentioned by four high experience participants.

Isolation-Withdrawal from Activity

This scenario represented the only other scenario besides Forgotten Conversation in which the majority of explanations were categorized as Cognitive/Emotional/Social issue. The most frequently mentioned explanation was that the resident may be depressed, which included comments about feeling sad, lonely, and missing loved ones (see Figure 11). As one participant described, "It could be that you know someone in their family died. It could be that they're not seeing any of their family and that nobody cares about them." Nine of the 15 comments related to Depression came from high experience participants.

Table 20

Explanations for the Isolation-Withdrawal from Activity Scenario

		Experience Level		
		Low	High	All
General		12	18	30*
	Aging	0	0	0
	Health declining/Getting worse	0	0	0
	Not feeling well/sick	5	8	13
	Other	7	10	17
Specific		29	31	60*
	Cognitive/Emotional/Social issue	20	13	33
	Physical health issue	5	11	16
	Resident preference not met	4	3	7
	Other	0	4	4

* $p < .05$ (i.e., category is significantly over or underrepresented)

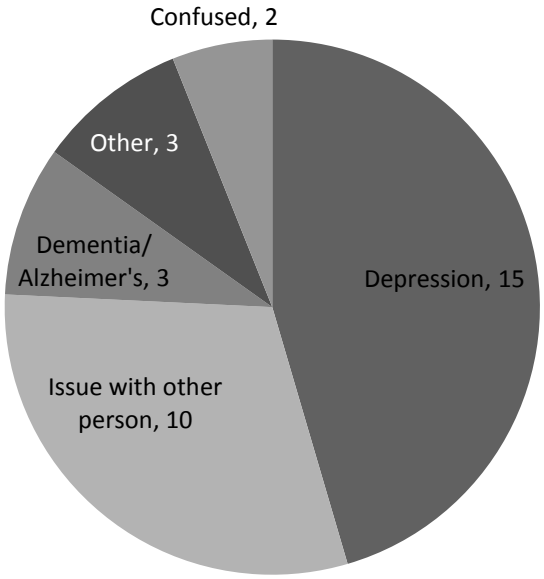

Figure 11. Frequency of participant explanations coded as Cognitive/Emotional/Social issue for the Isolation-Withdrawal from Activity scenario.

Second to depression, participants described that the resident may have a conflict or issue with another person (e.g., another resident, the activities director) and are therefore trying to avoid that individual. Participants explained this as, "Well he could've got into it with another resident and he just don't want to be around him." Explanations of this type were primarily provided by low experience participants (only two came from high experience participants). The remaining explanations in this category came primarily from low experience participants, who provided the majority of explanations coded as Cognitive/Emotional/Social issue for this scenario.

The next most frequently discussed explanations were under the General category, and participants suggested that a resident may avoid activities and interaction if they were feeling sick or unwell. Additionally, many explanations coded as Other within the General category attributed the situation to a resident just not feeling like it. As one participant explained, "And sometimes they just, 'I'm not feeling it today. I just want to be left alone and relax.'"

Participant explanations were not shared by the SME, whose explanations included that the resident may be fatigued or preoccupied, or does not like the particular activity being offered. Although there were seven comments made by participants similar to this latter explanation, the SME did not mention the possibility of depression or interpersonal issues.

Summary

Overall, participants expressed concern for most of the scenarios presented to them. Although participants were generally consistent in terms of which scenarios elicited concern versus which did not, their ratings of concern for each scenario were

variable. Participants' explanations for the scenarios were typically specific in nature rather than general, and participants generated a wide range of explanations across the various scenarios, with the majority classified as Physical health issues. Their explanations were consistent with the SME's explanations for the most part.

Although significant differences between low and high experience participants were not observed, their patterns did vary. The high experience group provided more explanations related to Physical issues, and this difference appears to be driven primarily by the Dinner Complaint, Forgotten Conversation, Crossword Trouble-Confused Speech, and Cough-Confusion scenarios. The cues presented in these scenarios were primarily cognitive in nature; however high experience participants were more likely than low experience participants to be able to provide physical explanations. Additionally, for the Trouble Walking-Dizziness and Crossword Trouble-Confused Speech scenarios, the explanations provided by the high experience participants tended to overlap with the SME's explanations to a greater extent compared to the low experience participants.

Actions

In addition to providing explanations for why the situation depicted in the scenario might be occurring, participants were also asked to describe what actions they might take to handle the situation. The range of actions described by participants is presented in Table 21. The first category of actions, Gather/use information, referred to participants obtaining information, or using information they may have already known about the resident to assist in assessing the situation. Four of the categories of actions described involving or communicating with other healthcare professionals, either within or outside of the facility. For example, participants' descriptions of going to the

Medication Technician, nurse, or supervisor for assistance were coded as Report to staff with higher authority, whereas notifying the other caregivers of the situation was coded as Inform other staff.

Participants also discussed taking steps to address a resident's immediate needs, such as sitting the resident down to avoid a fall, cleaning the resident up and getting him/her into clean clothes after an episode of incontinence, or offering a substitute meal if the resident did not want to eat the offered entrée. Other actions included notifying the resident's family, providing encouragement and assistance to the resident, redirect of reorienting the resident if he/she was confused, making a long-term change (e.g., switching from underpants to adult diapers, implementing a walker or wheelchair), monitoring the resident, and documenting the situation in facility log books.

Table 21

Participants' Reported Actions Collapsed Across All Scenarios

	Experience Level		
	Low	High	**All**
Gather/use information	348	388	736*
Report to staff with higher authority	72	64	136*
Address immediate need	57	61	118
Monitor	31	43	74*
Notify family	16	36	52*
Provide encouragement/assistance/comfort	30	28	58*
Document	20	16	36*
Other	13	15	28*
Inform other staff	9	12	21*
Redirect/reorient	14	7	21*
Involve outside healthcare professional	8	12	20*
Long-term change	9	9	18*
Involve emergency services	3	7	10*

* $p < .05$ (i.e., category is significantly over or underrepresented)

To determine whether participants' reported actions were equally distributed among the Action categories, a chi square goodness of fit test was conducted. Gather/use information and Report to staff with higher authority were significantly overrepresented, whereas the remaining action categories (except for Address immediate need) were underrepresented, χ^2 (12, N = 1328) = 4442.18, $p < .001$. A chi square test of independence could not be conducted due to minimum cell size, however the general pattern of actions was fairly consistent between low and high experience participants. The exceptions to this include that high experience participants more often described monitoring the resident and notifying family. The distribution of actions by scenario is presented in Table 22. Gather/use information was consistently the most discussed action. The second most discussed action was Report to staff with higher authority for five of the scenarios, and Address immediate need for the remaining two scenarios.

For each scenario, the SME was asked to provide a rating of how important it is that a caregiver performs the following tasks: a) inform supervisor of medication technician, b) contact 911 or send resident to the emergency room, c) inform the resident's family, and d) monitor the resident more closely. The scenarios for which the SME responded with 'Very Important" or "Essential", the two highest ratings, will be discussed. Participants' actions across all seven scenarios are presented in Table 22. The SME rated the action of reporting to staff with higher authority as 'Essential" for the Dinner Complaint, Trouble Walking-Dizziness, and Cough-Confusion scenarios, and as 'Very Important' for all the remaining scenarios. As depicted in Table 22, participants' responses most closely corresponded to the SME's suggestion for the Trouble Walking-Dizziness scenario. The Cough-Confusion scenario also received many mentions of

informing a superior, but if all participants had mentioned it at least once it would have had a minimum frequency of 32. The SME also rated reporting to a superior as 'Essential' for the Dinner Complaint scenario, which participants rarely thought warranted this action.

Contacting 911 or sending the resident to the emergency room was rated by the SME as 'Essential" for the Trouble Walking-Dizziness and Cough-Confusion scenarios. There were only two scenarios in which participants mentioned contacting 911, but the number of mentions was few, indicating that the vast majority of participants would not take this action, contrary to the SME's expectations. Contacting 911 was also rated as 'Very Important' for the Crossword Trouble-Confused Speech scenario, and participants did not mention taking this action once for those scenarios.

Informing a resident's family received a rating of 'Essential' for the Trouble Walking-Dizziness and Cough-Confusion scenarios, and 'Very Important' for the Forgotten Conversation, Crossword Trouble-Confused Speech, and Incontinence scenarios. Again, very few participant responses indicated they would take this action for the above scenarios. Interesting, the scenario that participants were most likely to contact family, the Isolation-Withdrawal from Activity scenario, was not rated as 'Very Important' or 'Essential' by the SME.

Table 22

Actions Reported by Scenario

	Scenario						
	Dinner Complaint	Incontinence	Forgotten Conversation	Trouble Walking-Dizziness	Crossword Trouble-Confused Speech	Cough-Confusion	Isolation-Withdrawal from Activity
Gather/use information	56	90	85	147	88	138	132
Report to staff with higher authority	**5**	**16**	**16**	**31**	**22**	**25**	**21**
Address immediate need	51	15	0	40	2	7	3
Monitor	**4**	**7**	**9**	**14**	**13**	**15**	**12**
Notify family	**1**	**7**	**7**	**9**	**9**	**8**	**11**
Provide encouragement/ assistance/comfort	4	5	0	5	8	5	31
Document	1	3	7	7	8	6	4
Other	4	1	2	5	2	4	10
Inform other staff	0	3	4	2	8	1	3
Redirect/reorient	0	0	5	0	4	11	1
Involve outside healthcare professional	0	2	1	6	3	5	3
Long-term change	0	16	0	2	0	0	0
Involve emergency services	**0**	**0**	**0**	**7**	**0**	**3**	**0**

Note. Bolded rows indicate actions that were included in the SME survey.

The final action the SME rated was monitoring the resident more closely, which was described as 'Essential' for the Trouble Walking-Dizziness and Cough-Confusion scenarios, and 'Very Important' for all of the remaining scenarios except for Isolation-Withdrawal from Activity. Although the most participant mentions of this action were for the Trouble Walking-Dizziness and Cough-Confusion scenarios, it was mentioned by no more than half of participants. Monitoring was also discussed relatively frequently in the Isolation-Withdrawal from Activity scenario, whereas the SME did not consider this scenario to warrant monitoring.

One consideration to keep in mind when comparing the SME's ratings and participants' responses is that some of these actions, specifically contacting emergency services and notifying family, may not be steps that participants are allowed to take at different facilities. Several participants noted that it would be the nurse's or supervisor's responsibility to perform these actions. However, reporting to a superior staff member and monitoring were not affected by these chain of command issues, and these two actions were underreported by participants.

Returning to Table 21 reveals that more than half of the actions participants discussed potentially taking belonged to the category of Gather/use information. The reason that this category combines two related but separate actions is that a clear distinction between gathering and using information was not possible due to the manner in which participants described these actions. Often participants stated that to understand the situation presented in the scenario, "it would depend on" or they "would need to know" various pieces of information, such as the resident's health status. Because the discussion was based on scenarios of fictional residents, participants could not express

whether the information in question was something they would already know or have to acquire.

Within the Gather/use information category, comments were further coded in terms of what type of information was mentioned (see Table 23). The Cue elaboration category was used to capture participants' requests for more specific information regarding the cues presented in the scenario, typically regarding the duration of the cue. For example, in the Cough-Confusion scenario, participants discussed wanting to find out how long the cough and confusion had been occurring, what type of cough the resident had, and whether the resident was confused about other things besides his/her location. Participants also discussed wanting information about the resident's characteristics and history (e.g., routine, likes/dislikes), current and recent state (e.g., how the resident is feeling, what the resident was doing recently), health (e.g., existing conditions, symptoms), and family dynamics (e.g., how often family visits).

Table 23

Gather/Use Information Sub-categories

	Experience Level		
	Low	High	**All**
Cue elaboration	76	75	151*
Resident characteristics & history	35	36	71*
Resident current & recent state	88	86	174*
Resident health	134	180	314*
Resident family dynamics	6	1	7*
Other	9	10	19*

* $p < .05$ (i.e., category is significantly over or underrepresented)

These categories of information were subjected to a chi square goodness of fit test to determine if participants' comments were equally distributed among them. Cue

elaboration, Resident current and recent state, and Resident health were significantly overrepresented, whereas Resident characteristics and history, Resident family dynamics, and Other were significantly underrepresented, χ^2 (5, N = 736 = 544.90, $p < .001$. This finding suggests that these types of information may be the most critical to learning more about what is happening to a resident, at least in the eyes of the participants. A chi square test of independence could not be conducted due to minimum cell size requirements.

Within several of the Gather/use information categories, participants' reported actions were coded in terms of the level of specificity used. For example, gathering information about a resident's health could be general (e.g., does the resident feel sick) or specific (e.g., what are the resident's vitals). The frequency of general and specific codes for each of the Gather/use information categories is presented in Table 24. Comments related to specific information were overrepresented whereas requests for general information were underrepresented, χ^2 (1, N = 566 = 199.46), $p < .001$.

Table 24

Frequency of General and Specific 'Gather/Use information' Codes by Experience Level

		Experience Level		
		Low	High	**All**
General		64†	51†	115*
	Resident characteristics & history	3	4	7
	Resident current & recent state	46	34	80
	Resident health	11	13	24
	Resident family dynamics	4	0	4
Specific		199†	252†	451*
	Resident characteristics & history	32	32	64
	Resident current & recent state	42	52	94
	Resident health	123	167	290
	Resident family dynamics	2	1	3

* $p < .05$ (i.e., category is significantly over or underrepresented)
† $p < .05$ (i.e., category is significantly over or underrepresented)

To determine whether there was a relationship between the specificity of information discussed and experience level, a chi square test of independence was performed. The results yielded significance, such that low experience participants were more likely than high to describe gathering general information, whereas, high experience participants were more likely than low to describe gathering specific information, χ^2 (1, N = 566) = 4.90, $p < .05$. This effect appears to be driven mainly by the high experience group's discussion of specific resident health information, which was approximately 36% higher than the low experience group's comments.

Summary

Participants described a wide range of actions that might relevant across the various scenarios. Participants' most frequently discussed course of action to handle concerns was gathering and using information, such as information about the resident or more detailed information about the cues that initiated their concern. Within the discussion of gathering and using information, high experience participants were more likely to describe specific types of information than low experience participants, suggesting they might have a better understanding of what information is useful to narrowing down what is happening to a resident. However, using the SME's report as a yardstick, participants reported they would engage in certain actions, such as reporting to their supervisor, far less than recommended by the SME.

Knowledge

Participants mentioned various types of knowledge during the scenario-based interview, which are presented in Table 25. Participants expressed knowledge that was coded as Health conditions/Symptoms. These comments primarily were descriptions of

how certain symptoms or behaviors were associated with particular diseases or health conditions, such as "When they're having a stroke, sometime their words, yeah, they words sometime don't make sense." Aging knowledge included comments referring to the elderly, older people, seniors, or residents as a group and how certain issues or behaviors are a result of the aging process (e.g, confusion, memory loss). For example, participant comments in this category included, "Actually, the elderly, anything that you introduce that is new to them, it's a worry to them," and, "…with elderly, most of the time that will happen. Like, "Where am I," and stuff like that." Treatments/Medication captured participants sharing their knowledge of what different medications and treatments are used for, as well as common side effects. For example, one participated commented, "There are some blood pressure medicines where you have to be careful, can't get up really fast and have to get up really slowly."

Table 25

Knowledge Reported by Experience Level

	Experience Level		
	Low	High	**All**
Health conditions/Symptoms	47	74	121*
Aging	41	50	91*
Treatments/Medication	16	16	32*
Organizational policy/protocol	12	13	25*
Caregiver preference/perspective	6	16	22*
General knowledge/common sense	7	14	21*
Other	9	5	14*

* $p < .05$ (i.e., category is significantly over or underrepresented)

Organizational policy/protocol comments reflected participants' knowledge of facility rules or state regulations governing their behavior. For example, one participant stated, "When they fall, you gotta call the MedTech. We can't pick them up," and another

shared that, "…there's certain things that we can handle and we're allowed to handle by law. And there are certain things that we can't do." The category of Caregiver preference/perspective was used to code comments participants made about how they would want to be treated if they or a loved one were being cared for, such as "Like they say, "Do unto others as you like them to do unto you." This category also contained references to participants' own experience of different symptoms. For example, during the Forgotten Conversation scenario discussion, one participant stated, "Even sometimes it happens to me too. I will definitely forget a conversation." The category of General knowledge/common sense was used to code instances in which participants indicated that the reason they interpreted a scenario a certain way or chose a particular action was because it was common sense, obvious, comes them naturally, or is second nature or instinct.

To determine whether the knowledge categories were discussed with equal likelihood, a chi square goodness of fit test was conducted. The results indicated that comments pertaining to Aging and Health conditions/Symptoms were overrepresented whereas the remaining knowledge categories were underrepresented, χ^2 (6, N = 326) = 225.67, $p < .001$.

There was not a significant relationship between knowledge type and level of experience, χ^2 (6, N = 326) = 7.48, p = .28. However, high experience participants on average mentioned knowledge more often (M = 11.75, SD = 5.56) than low experience participants (M= 8.63, SD = 4.87), and this was true for all of the categories with the exception of Treatments/Medication and the Other category. However, this difference was not significant, t(30) = -1.69, p = .10. Examining the variability within each

experience group showed wide ranges for both experience groups. The number of knowledge-related comments provided by a single participant ranged from 4-23 among the low experience group, and from 5-24 among the high experience group.

Summary

During their discussions of the scenarios, participants expressed knowledge in several categories, such as aging, health conditions, and medications and treatments. Interestingly, the number of times a participant discussed knowledge varied widely within each experience group, with some participants only mentioning knowledge a few times and others several dozen times. One additional consideration to keep in mind is that although participants' comments were coded as knowledge, this did not mean that their statements were correct. That is, participants may have been expressing misconceptions they held.

CHAPTER 4

DISCUSSION

The goal of this dissertation was to gain a greater understanding of decision making among caregivers who work in assisted living settings. Specifically, this study aimed to explore: a) the components of decision making, including cues, explanations, actions, and knowledge, and b) the role of experience in decision making. The major findings and theoretical contributions for each of these two goals will be discussed in turn.

Components of the Decision Making Process

The various cues participants described were categorized as Cognitive, Physical, or Emotional. Many of the cues discussed by participants in the critical incident interview mirror Tingström et al.'s (2010) findings on the early signs and symptoms of infections detected by nursing assistants. Although the categorization of cues differed, many of the cues reported by the present study's participants were also reported by that sample of nursing assistants working in nursing homes. Interestingly, participants in Tingström et al.'s study were prompted to focus specifically on indicators of infection, whereas the present study's participants were given no such restriction in terms of what types of incidents to consider. Because many of the cues reported are consistent between the two studies, this suggests that these cues are likely indicators of multiple health issues rather than just infection. Unfortunately, Tingström et al. did not provide any frequency data regarding how often each indicator was reported; therefore it is not possible to

determine whether the distribution of cues among the Cognitive, Emotional, and Physical categories was consistent between the two studies.

Participants were able to provide explanations for the situations presented in the scenario-based interview, and these explanations varied across the different scenarios. The explanations provided by participants were predominantly specific in nature, although general explanations such as "He/she may be sick" were provided to a lesser extent. Specific explanations were primarily related to Physical health issues, although for a few scenarios explanations were more often described as Cognitive/Emotional/Social issues. For several of the scenarios, participants' explanations overlapped considerably with the explanations provided by the SME. This was especially the case for the Dinner Complaint, Forgotten Conversation, and Crossword Trouble-Confused Speech scenarios.

However, participants' responses were less consistent for several of the other scenarios. For the Incontinence scenario, participants' most often discussed explanation was that the episode may have been indicative of the onset of incontinence; the SME did not mention this explanation at all. In the Trouble Walking-Dizziness scenarios, participants and the SME mentioned many of the same explanations, but they were weighted differently. For example, some of the explanations described by the SME as the most likely cause of the scenario comprised only approximately 10% of participants' explanations, whereas what the SME mentioned as possible, but less likely explanations were discussed by participants to a much greater extent. Responses to the Isolation-Withdrawal from Activities scenario varied considerably between the SME and participants.

In Sund-Levander and Tingström's model of decision making (2013), they did not include the component of alternative generation as described by Carroll and Johnson (1990). Although Sund-Levander and Tingström did not explain why this component in the decision making process was not included, it may have been due to the nature of their specific line of inquiry. The authors were focused specifically on how their participants detected cases of infection. Because the topic of discussion was restricted to this one type of health issue, participants may have had no reason to discuss other issues. In my study, on the other hand, the scenarios introduced a range of cues that could be related to numerous issues, allowing participants to discuss a range of potential explanations. With this flexibility, my study demonstrated that caregivers do engage in this process of generating alternative explanations, and the nature of their explanations can be described at a high level as General or Specific.

Among the actions participants' reported potentially taking in response to the scenarios, the vast majority involved gathering or using information. Although this component of the decision making process is not new (Carroll & Johnson, 1990), Sund-Levander and Tingström's (2013) focus was on the strategies that were used to gather and evaluate information, rather than on the nature of the information itself. The data from the current study speak to the categories of information that caregivers discussed as being relevant to their decision making process, which included information about the resident's health, current and recent state, personal history, family. Participants also discussed the need to gather information related to the specific cues that had been observed, such as duration, frequency, and severity.

Although gathering and using information was the most frequently discussed action, participants also reported a range of other actions such as reporting the scenario to someone with higher authority, involving outside healthcare professionals and emergency services, notifying family, encouraging and comforting residents, monitoring, and documenting. This greatly adds to the choice of actions discussed by Sund-Levander and Tingström (2013), which were essentially just reporting it up the chain of command or not. These data serve as one of the few, perhaps only, accounts of the variety of actions that caregivers in assisted living report engaging in.

Participants' reported actions were reviewed in conjunction with the SME's ratings of how important it was that a caregiver takes certain actions, and the data revealed many discrepancies between the two accounts. Overall, participants' reports suggested they would take far fewer actions than the SME rated as very important or essential. This was surprising given that for many of the scenarios, participants' explanations were consistent with the SME's explanations. This suggests that although caregivers were able to link a variety of cues with their underlying causes, they did not understand what actions should be taken to effectively handle the situation.

This study identified various facets of knowledge that participants brought to bear in their decision making process. Among these, knowledge of health conditions and symptoms, as well as knowledge of aging were discussed with the greatest frequency. Discussed to a lesser extent were the caregiver's own preferences/perspectives, knowledge of organizational policy, and treatments/medications. Information about the resident was also a relevant category of knowledge participants discussed (although this was analyzed as part of gathering and using information).

Sund-Levander and Tingström (2013) included a component labeled Personal Experiences and Preconceptions in their model, which can be taken as their representation of knowledge. The types of personal experiences and preconceptions that they described are consistent with some of the categories of knowledge described by this study's participants, such as the role of knowing the resident and ideas about aging. They also described how personal experiences, such as having been sick themselves, influenced their assessment of resident illness. This is similar to the category of Caregiver preferences/perspectives identified in the current study. However, Caregiver preferences/perspectives also encompassed participants' comments on treating others how they would want themselves or their family to be treated, and using their own experience of many issues that came up in the scenarios, not illness exclusively.

The findings of this study also suggest that knowledge has a broader impact on the decision making process that depicted previously. Sund-Levander and Tingström (2013) represented their concept of knowledge as only influencing the recognition component of decision making. However, I propose that knowledge impacts several aspects of the decision making process, including recognition, alternative generation, and choice of action. For instance, knowledge of health conditions and symptoms is what allows caregivers to generate explanations for the cues they observe, and knowledge of organizational policy is used by caregivers to determine what actions they are allowed to take. Figure 12 depicts how the findings of this study have been incorporated into a revised model of caregiver decision making.

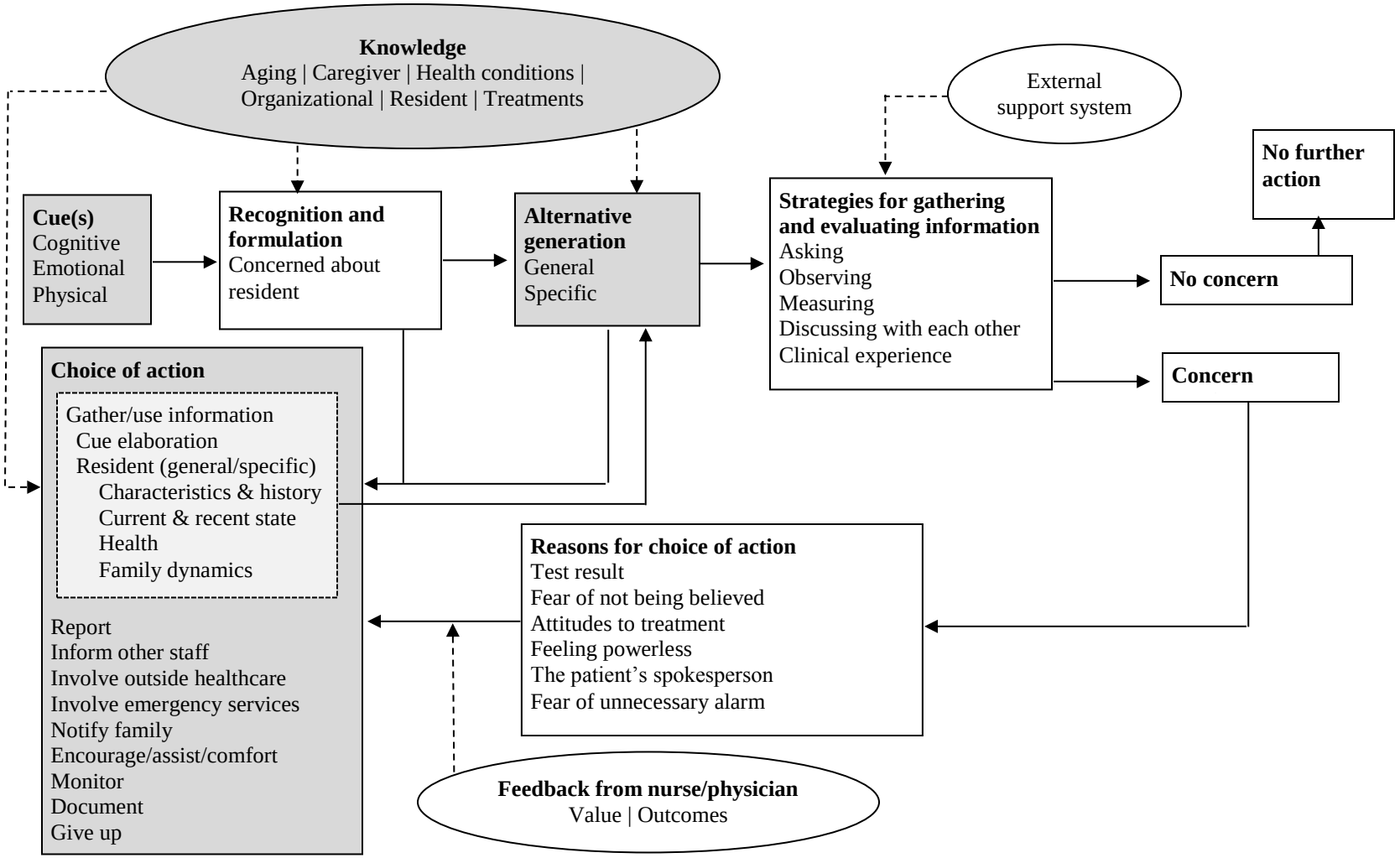

Figure 12. Revised model of caregiver decision making in assisted living. Shaded shapes represent revised components.

Role of Experience

Significant differences between the two experience groups were not observed for the majority of the results. The only manner in which low and high experience participants differed statistically was the distribution of comments related to gathering and using information. High experience participants discussed specific information more often than expected, whereas low experience participants discussed specific information less likely than expected. Although not statistically significant, differing patterns were observed between the low and high experience groups, particularly with respect to the explanations they provided for the various scenario. Overall, high experience participants were more likely than the low experience group to discuss Physical issues as the underlying cause of the symptoms observed in the scenarios. Additonally, for two of the seven scenarios, the explanations provided by the high experience group were a better match with what was described by the SME.

One potential explanation for why increased experience in this field may not alter decision making processes is a lack of informative feedback. The importance of feedback has been highlighted in the skill acquisition and expertise literature (Kahneman & Klein, 2009; Lewandowsky & Thomas, 2009) and has also been included in some models of decision making (Carroll & Johnson, 1990) as a critical component of learning. In the context of assisted living, informative feedback might include information on resident outcomes. Although it was not a focus of the current study, several participants indicated that feedback is often not provided from the nurses who supervise the caregiving staff. Instead, to find out the details of what happened to a resident after an incident, the caregiver reported having to initiate a line of questioning with the nurse.

Although feedback is included in the model of nursing assistant decision making described by Sund-Levander and Tingström (2013), their conceptualization of feedback is inconsistent with the type of feedback discussed above. Rather, they described feedback in terms of value, or the degree to which nursing assistants felt that their input was positively responded to and considered by nurses and physicians. Therefore, a necessary addition to a model of caregiver decision making in assisted living is feedback that provides information on resident outcomes, such as the validity of cues perceived by caregivers and whether their actions were appropriate for the given issue. It is through this type of feedback that caregivers' knowledge will increase and allow for improved decision making performance.

Although experience working in assisted living was not found to have a profound effect on decision making, and the previous sections outlined some possible explanations for why that may be, another possibility is that experience was not found to have an effect due to the design choices made in this specific study. One such choice was the length of time used to define the low and high experience groups (1-16 months, 3+ years, respectively). It may have been the case that the operational definition of low experience was too high. For instance, one participant commented that, "I only been here a month, but I pretty much know all the residents, how they act, everything." The acquisition of certain types of knowledge, such as knowledge of the resident, may be taking place earlier than expected, as early as within the first month.

Another potential issue may have been the limited manner in which experience was considered. In this study, experience was limited to time worked in an assisted living setting, but caregivers likely refined their decision making through a variety of

other relevant experiences and these were not controlled for in the current study. For example, 13 of the 16 low experience participants reporting currently or previously working with older adults in another type of care setting. One low experience participant reported that she had recently completed nursing school (which is a level of education higher than what is held by most other caregivers), and that much of her knowledge of health conditions and symptoms came from her advanced education. Some participants described having acted as informal caregivers to family members that were ill or suffering from Alzheimer's or dementia. Because these types of experiences were not controlled for, they may have contributed to participants' decision making as measured in this study.

Practical Contributions

One outcome of this study is providing a more detailed profile of caregivers working in assisted living settings. There is a tendency to think of these caregivers as performing simple work, perhaps as a result of the low-pay that is characteristic of this field. However, the data described in this dissertation provide evidence that most caregivers are engaging in relatively complex cognitive processes. They are not simply observing and reporting, but they are investigating why residents behave in certain ways or experience different symptoms, and responding to these issues with a variety of approaches. They expressed how so much of their caregiving behavior depends on numerous factors such as the intricacies of each individual resident, and that they have to be cognizant of these details and use them in their everyday work.

In addition to better understanding the complexity of caregiving, the findings from this study can contribute to the delivery of care for the older adult population in

numerous ways. The range of cues identified may serve as guidelines that can be used in the training of assisted living caregivers. The findings of this study highlight that important cues may present as cognitive, physical, or emotional changes in residents. Rather than directing caregiver to report any changes, the cues identified by the present study can be provided to caregivers as concrete examples of the variety of cues that might signal a health or well-being issue.

Additionally, the cues identified in this study may serve an audience beyond assisted living. Caregivers in home health might greatly benefit from training on potential cues, particularly given that they are often delivering care without any peers or immediate access to a nurse or supervisor. In these situations, an appreciation of how seemingly innocuous cues might indicate serious health issues is critical. This information may also be useful to informal caregivers, such as family members or friends of older adults, in addition to professional caregivers. Detecting changes in a loved one is a task that informal caregivers are also engaging in, and having little or no training puts them at a disadvantage. These individuals would also potentially benefit from guidance regarding how to appreciate and interpret various cues.

Another implication of the current research is identification of caregivers' information needs. Although Sund-Levander and Tingström (2013) described the *strategies* used by caregiver to gather and evaluate information, the *nature* of the information used by caregivers was unknown. By asking participants what information they would want during the scenario-based interview, participants could think about ideal information gathering. The information they discussed may not always be readily accessible in practice if communication practices break down, such as failing to

document in patient logs or incident reports. Identifying information needs may be used to train caregivers on the necessity of documentation and communication, as well as revealing opportunities for data collection and data sharing technologies.

Lastly, the analysis of participants' explanations and actions compared to the SME's responses indicated that although there was a match for many of the scenarios in terms of the explanations provided, participants' actions indicated a substantial deviation from what the SME expected. This mismatch between reported actions and expected actions may suggest that the feedback caregivers receive on their actions is particularly lacking. Therefore, nurses and supervisors may benefit from focusing on teaching caregivers proper responses to a variety of care situations. This could be accomplished by turning every 'incident' into a teaching moment, during which feedback is provided promptly, rather than being delayed until the next staff meeting. The feedback should focus on elucidating the relationships between the cue and underlying issue, and between the underlying issue and appropriate response.

Future Directions

Many opportunities exist to build upon the research described in this dissertation. The critical incident approach utilized self-reporting of cues, which is heavily reliant on participants' memory for events. Although it is tempting to assert that the relative frequency of the cues mentioned may be indicative of their actual occurrence, this would be inappropriate. Because participants chose what incidents to discuss with the interviewer, their decision to describe one type of incident over another may have been driven by multiple factors, including the recency of the incident, the bizarreness of the cue, or the severity of the issue or outcome.

The drawbacks of self-report data were also present in the scenario-based interview. When discussing what information participants would need or use, they were capable of discussing information or knowledge that they might not actually have in their work environment. For example, a low and high experience participant might both describe that they would need to know about the medication the resident was taking. A high experience participant might actually already have this information stored in their mind, whereas a low experience participant might need to examine resident's records or confer with another caregiver to discover this information.

Alternative approaches to studying decision making processes among caregivers that are not subject to the limitations of self-report include observational studies or analysis of incident documentation. Observing caregivers as they work with residents might give a more accurate depiction of the frequency with which different issues present themselves, as well as how caregivers respond, including what information is gathered or used. Examining reports of incidents that have already occurred may be another valuable avenue of inquiry. This type of information often resides in a log book that caregivers use to document any changes in resident status, as well as more formalized incident reports that must be completed after more serious incidents, such as falls, occur.

Another limitation of the current study involved judging the "correctness" of participant responses. Although the inclusion of the SME data allowed for some evaluation of whether participants were responding ideally, it is possible that the SME had her own misconceptions or was biased in some way. The inability to judge the accuracy of participant responses was a tradeoff of using the scenario-based approach. Therefore, future work might benefit from using scenarios based on actual incidents, in

which the root cause of the symptoms or behavior is known and can be used to assess how accurately caregivers assess and respond to the scenario.

Finally, the role of experience in caregiver decision making remains to be clearly understood. This study focused on experience as a function of years working in assisted living, and did not control for other forms of experience that may have a substantial impact of caregiver decision making, such as experience in related fields, personal experience, and education. Future research on how decision making changes as a function of experience may benefit greatly from careful consideration and inclusion of other forms of relevant experience.

Aging related knowledge, which was expected to demonstrate the effect of experience, was unable to be accurately measured due to a flawed questionnaire. The fact that there are not any widely used assessment techniques begs the question of how supervisors assess what caregivers know about aging and health conditions among older adults. Development of these types of measures might greatly improve our ability to assess how components, such as knowledge, develop and change as a function of experience.

As research continues in this area, our understanding of how caregivers in assisted living and other fields of long-term care make decisions will continue to grow. As older adults seek out these forms of care, it will become even more critical to share these insights with the caregivers and administrators in long-term care so they can continue to improve the delivery of care and support the aging population.

APPENDIX A

SCREENING SCRIPT

Date: _____

Participants will be recruited from local assisted living facilities and personal care homes.

Thank you for your interest in our research study. To determine if you are eligible for this study, I need to ask you a series of questions.

1. Name:
2. Phone #:
3. Email:
4. Are you currently employed by an assisted living facility or personal care home as a caregiver to older adults?

5. What is the name of the assisted living facility or personal care home you currently work at?

6. How long have you worked at your current assisted living facility? Please be as accurate as you can down to the month, so you can say for example, 1 year and 3 months, instead of just rounding down to 1 year.
7. Have you worked in other assisted living facilities or personal care homes housing older adult residents? This does NOT include working in a nursing home, hospice, or home health, only assisted living or personal care homes.
    - **If yes**: For how long? Again, please be as accurate as you can, down to the month.
8. Are you at least 18 years old?
9. On average, how many hours per week do you work as a caregiver to older adults in assisted living facilities or personal care homes?
10. What shift do you primarily work?
11. Do you work in a facility or unit specifically for individuals with dementia or memory issues?

The number of year/months that a person has worked in assisted living facilities and personal care homes will be summed. If this value is between 1-14 months, or greater than or equal to 3 years, the participant is eligible for the study and will be asked to schedule the interview. If any of the other eligibility criteria are not met, participant will be informed they are not eligible for the study. If eligible, they will be scheduled.

Scheduled for date/time _____

APPENDIX B

INTERVIEW SCRIPT

General Introduction

Thank you for participating in this research study. Before we get started I would like you to please turn off your cell phone, so we do not have any interruptions. Thank you.

My name is Sara, and I'm a graduate student at Georgia Tech. Today I'd like to talk to you about your thoughts and experiences related to providing care to older adult residents living in assisted living communities.

Before we begin, please read over and sign this informed consent document.
[Administer informed consent, answer any questions.]

People like you in a care giving position, who may become familiar with residents because you spend a good bit of time with them, are probably the people who are going to notice first if something is going on with the resident that might be a sign that of a problem with their health or well-being. So what I'm really hoping to understand if how you do this

I'd like to turn on the recorder now. As a reminder, your comments will not be shared with your employers or supervisors. The audio recording will be labeled with a code number rather than your name, so it will not be identifiable as coming from you.

[Turn on recorder.]

Please remember that there are no right or wrong answers for anything we will discuss today. I am interested in learning about your thought process and your experiences. Some of my questions may seem repetitive, so it is okay if your answers overlap.

Do you have any questions for me?

General Probes (to be used throughout interview as needed to elicit or clarify interviewee responses)

- Can you tell me more about that?
- Can you tell me what you mean by ___*<repeat participant's wording>*__?
- *If participant is having difficulty answering the question (particularly likert scales), then say: "*Please, take a moment and think about it. Then give me your best guess."

Critical Incident Interview

I'd like for you to try to think about times when you were concerned about a resident's health or well-being in some way. This might include situations in which you had a very specific concern, but also situations in which you thought something was going on, something seems off, even if you didn't know exactly what is was. This could also include situations where you had been trained or had learned to notice or pay attention to certain things. Please only think about examples from working in assisted living facilities or personal care homes, not home care/hospice/nursing homes. Try to think for a minute or two and feel free to jot down a note if you think of an example. We'll focus on each example one at a time.

For each incident, proceed through the following interview questions before moving on to the next incident.

- Let's talk about the first example. Please give me an overview of the situation.
- What made you become concerned in the first place?
    - Did you notice something unusual?
        - If so, was it unusual in general or unusual for that particular resident?
        - **Probe***: If response is something vague like "she wasn't being herself", ask the following:*
            - What specifically was the person doing or not doing that you thought was unusual?
            - **Probe**: If you had to explain to someone else how this was unlike the person, what would you say?
    - Did anyone, like the resident, their family, or another colleague, mention something to you?
- How would you describe your concern? What do you think might be going on?
    - **Probe**: Did you have a specific concern, or did you just feel that something was "off"?
- If *concern is vague*: How did you know or why did you think that [*repeat the cue(s) they mentioned*] was something to be concerned about?
- If *concern is specific*: How did you know or why did you think that [*repeat the cue(s) they mentioned*] was related to [specific concern]?
- What did you do about your concern?
    - Follow up: Did you do anything else? For example, talk to the resident, their family or any colleagues?
- How did you know or decide to respond that way?

    - Follow up: Was there any standard policy or procedure that applied in that situation.
    - **Probe**: For example, if you notice this, you must do this?
- Did you consider any other solutions or responses?
- Were their other things you might have done but decided not to?
    - *If yes*: Why did you decide not to do that?
- Is there anything else you did, perhaps later on?
- What was the outcome?
- Was there any training that was helpful or necessary to you in dealing with this situation?
- Was there any previous experience you've had that was helpful or necessary to you in dealing with this situation?

After exhausting all incidents or reaching 35 minutes, move on to the following incident elicitation:

Next I'd like to change topics a little bit. I understand that noticing these subtle changes or issues can be really difficult. I'm sure it can be very easy to miss something. With that in mind, can you think of any examples where, in hindsight, there was an issue that negatively affected a resident's health or well-being, but for whatever reason, you didn't catch it or didn't respond in the best way. Perhaps looking back on it now, you might think to yourself, "I should have noticed that", or "I should have reacted differently."

- Please give me an overview of the situation.
- *If failure was associated with recognizing or interpreting cues*:
    - Why do you think you didn't notice what was going on?
- *If failure was associated with an inappropriate or lacking response*:
    - What do you think you should have done instead?
    - Why did you do [*reported response*] instead of what you think you should have done?
- Can you think of anything that might have helped you in that situation?
    - Follow up: Can you think of any training, knowledge, or information could have helped you in that situation?
- How long had you been working in assisted living with older adults when this happened?
- How long had you been working in that specific facility when it happened?

Can you now think about any examples of someone else making some type of mistake? Other people you've worked with, other caregivers in assisted living facilities?

- Please give me an overview of the situation.

- Do you have any ideas about why he/she made that mistake?
- Can you think of any training, knowledge, or information could have helped him/her in that situation?

After exhausting all incidents or reaching 10 minutes, move on to the scenarios.

Scenario-based Interview

Next I'm going to describe several hypothetical situations dealing with an older adult resident. For each one I'll ask you a series of questions about what you think and what you might do in that situation. As a reminder, some of my questions will seem repetitive, so it's okay if your answers overlap. And again, I'm trying to learn from you, this is not a test, there are no right or wrong answers.

Place a scenario card in front of the participant and read the scenario to them. Proceed through all of the interview questions before moving on to the next scenario.

- Would this cause you to be concerned?
- *If not*:
  - Why do you think it's not something to be concerned about?
- *If yes*:
  - *Place printed version of Likert scale in front of participant*. On a 1 to 5 scale, how serious would your concern be?
  - What would your concern be in this case? What do you think might be going on?
    - **Probe**: Do you have a specific concern or concerns?
- If *concern is vague*: Can you tell me why you think that [*repeat the cue(s) they mentioned*] was something to be concerned about?
- If *concern is specific*: Can you tell me why you think that [*repeat the cue(s) they mentioned*] is related to [specific concern]?
- Is there any additional information you would want to know to help you understand the situation?
  - Follow up: For example, is there anything you would ask the resident, their family, or other workers?
  - *If they mention specifics, follow up with what that information would tell them:*
    - What would it mean if ….? What would you do in that case?
- What would you do about your concern or concerns?
- How would you know or how did you learn to respond that way?

    - Follow up: Is there any standard policy or procedure that would apply in this situation?
    - **Probe**: For example, if you notice this, you must do this?
- Are they any other solutions or responses you would consider?
- Were their other things you might have done but decided not to?
- Is there anything else you would do, maybe later on? Like any type of follow up?
- Was there any training that was helpful or necessary to you in dealing with this situation?
- Was there any previous experience you've had that was helpful or necessary to you in dealing with this situation?

APPENDIX C

SERIOUSNESS OF CONCERN RATING SCALE

1	2	3	4	5
Not at all serious	Somewhat serious	Moderately serious	Very serious	Extremely serious

APPENDIX D

DEMOGRAPHIC AND EXPERIENCE QUESTIONNAIRE

Participant ID _____

Please answer the following questions. All of your answers will be treated confidentially. Any published document regarding these answers will not identify individuals with their answers. **If there is a question you do not wish to answer, please just leave it blank and go on to the next question.** Thank you in advance for your help.

Demographic Information

Gender: Male ☐$_1$ Female ☐$_2$ Age: _____

1. What is your highest level of education?

☐$_1$ No formal education
☐$_2$ Less than high school graduate
☐$_3$ High school graduate/GED
☐$_4$ Vocational training
☐$_5$ Some or in-progress college/Associate's degree
☐$_6$ Bachelor's degree (BA, BS)
☐$_7$ Master's degree (or other post-graduate training)
☐$_8$ Doctoral degree (PhD, MD, EdD, DDS, JD, etc.)

2. Current marital status (check <u>one</u>)

☐$_1$ Single
☐$_2$ Married
☐$_3$ Separated
☐$_4$ Divorced
☐$_5$ Widowed
☐$_6$ Other (please specify) _____

3. Do you consider yourself Hispanic or Latino?

☐$_1$ Yes
☐$_2$ No

3 a. If "Yes", would you describe yourself:

☐$_1$ Cuban
☐$_2$ Mexican
☐$_3$ Puerto Rican
☐$_4$ Other (please specify) _____

4. How would you describe your primary racial group?

☐$_1$ No Primary Group
☐$_2$ White Caucasian
☐$_3$ Black/African American
☐$_4$ Asian
☐$_5$ American Indian/Alaska Native
☐$_6$ Native Hawaiian/Pacific Islander
☐$_7$ Multi-racial
☐$_8$ Other (please specify) _____

5. Is English your primary language?

☐$_1$ Yes
☐$_2$ No

5 a. If "No", What is your primary language? _____

Employment Status & History

1. **What is your current job title?**

   _____

2. **What is the name of the assisted living facility you currently work at?**

   _____

   _____

3. **How long have you worked at your current assisted living facility?**

   Years _____

   Months _____

4. Do you <u>currently</u> work in any *other* assisted living facilities (besides the one you listed on the previous page) caring for older adult residents?

☐$_1$ Yes

If "Yes", please indicate the name of the facility or facilities and how long you have worked there:

Facility Name **Years/Months**

1._____

2._____

3._____

☐$_2$ No

5. Have you <u>previously</u> worked in *other* assisted living facilities housing older adult residents?

☐$_1$ Yes

If "Yes", please indicate the name of the facility and how long you worked there:

Facility Name **Years/Months**

1._____

2._____

3._____

4._____

5._____

$\square_2$ No

6. **In addition to your assisted living job, do you <u>currently</u> also work in any of the following fields?**

	Yes$_1$	**If yes, for how long (years/months)?**	**No$_2$**
a. Home health care/private duty with older patients			
b. Hospice care			
c. Nursing home/skilled nursing facility			
d. Retirement community			
e. Senior day care/senior center			

7. **Have you <u>previously</u> worked in any of the following fields?**

	Yes$_1$	**If yes, for how long (years/months)?**	**No$_2$**
a. Home health care/private duty with older patients			
b. Hospice care			
c. Nursing home/skilled nursing facility			
d. Retirement community			
e. Senior day care/senior center			

Current Job Status & Responsibilities

8. On average, how many hours per week do you work in your facility?

_____

9. What shift did you work during the last 7 days?

☐$_1$ Day shift (e.g., 7am-3pm)
☐$_2$ Evening shift (e.g., 3pm-11pm)
☐$_3$ Night shift (e.g., 11pm-7am)

10. What shift did you work most frequently during the last 2 months?

☐$_1$ Day shift (e.g., 7am-3pm)
☐$_2$ Evening shift (e.g., 3pm-11pm)
☐$_3$ Night shift (e.g., 11pm-7am)

11. On average, how many residents are you assigned to care for during your shift?

_____

12. Are you assigned to care for the same residents on most days you work, or do the residents you are assigned to change day-to-day or week-to-week?

☐$_1$ Same residents
☐$_2$ Residents change
☐$_3$ Combination – Some residents are the same, some residents are changed

13. Which of the following are included in your regular duties in the facility?

	Yes$_1$	No$_2$
a. Assisting residents getting to places outside of the facility (e.g., drive or escort residents)		
b. Assisting residents with social or recreational activities		
c. Clerical tasks or bookkeeping		
d. Companionship (e.g., chatting, social support)		
e. Cooking		
f. Light housekeeping (e.g., wash dishes or make beds)		
g. Heavy cleaning (e.g., vacuum or mop floors)		
h. Laundry		
i. Passing out medication or assisting residents with self-administration of medication		
j. Provide personal care of residents (e.g., help with bathing, dressing, using the toilet, walking)		
k. Serving meals		

Certification, Training, & Continuing Education

14. Please indicate all the health care certifications, licenses, and registrations that you currently have (choose all that apply).

- ☐1 Certified Nursing Assistant
- ☐2 Certified Medication Technician
- ☐3 Licensed Vocational or Practical Nurse
- ☐4 Registered Nurse
- ☐5 Other (please specify)

_____

_____

_____

- ☐6 None of the above

15. Did your current facility require you to complete employee orientation or another type of training before you began working with residents?

- ☐1 Yes
- ☐2 No (If "No", skip to question 16)

16. About how much time, all together, did you spend receiving this initial orientation or training?

- ☐1 Half of a work day
- ☐2 1 full work day
- ☐3 2-5 work days
- ☐4 6 or more work days

17. The state requires that you complete additional training each year. In the past year, which of the following topics have you learned about in any training or continuing education? (<u>choose all that apply</u>)

- ☐$_1$ First aid/CPR
- ☐$_2$ Resident care skills (e.g., helping with bathing, toileting)
- ☐$_3$ Dementia care
- ☐$_4$ Working with residents that act out or are abusive
- ☐$_5$ Monitoring residents for changes in health or well-being
- ☐$_6$ Medication management
- ☐$_7$ Resident's rights
- ☐$_8$ Communicating with residents
- ☐$_9$ Discussing resident care with residents' family members
- ☐$_{10}$ Recording/documenting resident information
- ☐$_{11}$ Organizing work tasks so that everything gets done on time
- ☐$_{12}$ Working with co-workers
- ☐$_{13}$ Working with supervisors
- ☐$_{14}$ Preventing injuries at work
- ☐$_{15}$ Other? (please specify)

_____

_____

_____

- ☐$_{16}$ Have not completed any additional training this year

APPENDIX E

KNOWLEDGE OF AGING QUESTIONNAIRE

One important part of taking care of older adults in assisted living facilities and personal care homes is understanding what changes are normal as a part of aging and what health conditions are common among older people.

We are trying to create a questionnaire that will help us determine how much knowledge a person has about aging. We would like your help to make it better.

Please answer this questionnaire the best you can. Because this is under development, we know there may be some questions that are not relevant to you in your job. After you finish the questionnaire, we can discuss any questions that were confusing, not relevant, or too difficult.

We appreciate your help in creating this new questionnaire!

1. Which of the following statements most accurately describes the U.S. population 65 years old and above?
    A. The majority of older adults (65 and older) are female.
    B. In the past 10 years the number of individuals over 85 has been declining.
    C. African American women outlive their Caucasian counterparts by 3-5 years.
    D. Greater than 35% of persons over the age of 80 are in Nursing Homes at any given time.
    E. A and C

2. Many older adults have chronic conditions and experience difficulties in performing specific activities. An Activities of Daily Living (ADL) assessment describes functioning such as:
    A. Toileting, bathing, dressing
    B. Climbing stairs, cleaning house, using public transportation
    C. Memory of recent events
    D. A and B
    E. A, B, and C

3. Smoking is a major risk factor in the population of age 60 and older for which of the following health problems?
    A. Chronic obstructive pulmonary disease (COPD), lung cancer, Gastroesophageal reflux disease (GERD), and stroke
    B. Macular degeneration
    C. Lymphoma
    D. A and B
    E. A, B, and C

4. Mrs. Jones has several chronic conditions, including hypertension. Which of the following statements about hypertension is true?
    A. Hypertension often is not responsive to treatment in older adults.
    B. Hypertension in older adults is defined as greater than 120/80, as in younger adults.
    C. Treatment of hypertension has been shown to have significant positive effects on subsequent cardiovascular morbidity and mortality.
    D. Hypertension has the highest incidence of morbidity in older adults in the U.S.
    E. B and C

5. Mrs. Smith is experiencing some hearing impairment, and has difficulty "catching" what her 7 and 10 year old granddaughters say. Which of the following statements about hearing impairment is true?
    A. Hearing impairments have a major effect on the mental functioning of older adults.
    B. Hearing impairments have been associated with isolation and functional decline.
    C. Hearing is assessed less often than other sensory functioning.
    D. A, B, and C

E. B and C

6. Mrs. Harris tells you that she has become shorter and more "round-shouldered" in the last 5 to 10 years, and has been told that she has osteoporosis. While offering suggestions for preventing or slowing down bone loss, it would be appropriate to mention all of the following EXCEPT:
    A. Weight bearing exercise
    B. Calcium supplementation
    C. Nonsteroidal anti inflammatory agents
    D. Vitamin D supplementation
    E. Raloxofene

7. In considering Mrs. Jackson's health conditions and when planning for her needs, it is important to understand normal changes that occur with age, and carefully assess functioning. Which of the following changes reflect the "normal" aging process?
    A. Difficulty with recall/retrieval of information and/or names.
    B. Loss of interest in an active sex life.
    C. Drastic limitations in the ability to learn new skills.
    D. Reduced need for sleep in persons over 75 years of age.
    E. Increased cell-mediated immune response to infections.

8. Stress incontinence is listed as one of Mrs. Kirk's conditions. Which of the following statements about stress incontinence is true?
    A. Incontinence is a normal change that occurs in women as they get older
    B. Incontinence can be a symptom of a urinary tract infection in older adults.
    C. Behavioral approaches to the treatment of incontinence, such as helping to accept incontinence, are effective.
    D. B and C
    E. A, B, and C

9. Which of the following describes a commonly occurring type of incontinence in older women?
    A. The involuntary loss of urine that occurs with coughing, laughing, or doing activities that increase intra-abdominal pressure.
    B. The sudden need to void with an inability to delay long enough to reach a bathroom.
    C. The loss of urine that occurs secondary to an over-distended bladder.
    D. Involuntary bladder contractions (detrusor hyper-reflexia).
    E. A and B

10. Age-related changes in the eyes can result in important changes in visual capabilities such as:
    A. Decreased sensitivity to glare, affecting the amount of lighting needed in adjacent areas.
    B. Decreased depth perception, leading to falls.

C. Decreased visual acuity (except for peripheral vision), necessitating more frequent testing of driving ability.
D. Gradual development of cataracts, requiring vision re-assessment every 3 years.
E. A, B, and D

11. When assessing or planning care for older adults, it is important to watch for symptoms of "geriatric syndromes", conditions to which the elderly are especially vulnerable. Examples of geriatric syndromes include all of the following EXCEPT:
    A. Falls/immobility
    B. Heart failure
    C. UTI/Incontinence
    D. Iatrogenesis
    E. Constipation

12. Delirium is a syndrome of aging that may be caused by a variety of factors. What would you want assess to determine if delirium may be occurring?
    A. Medications/polypharmacy
    B. Inflammation/infections
    C. Neurological functioning
    D. History of alcohol abuse
    E. A, B, and C

13. Both elders and their families/caretakers worry about changes in cognitive functioning and fear Alzheimer's disease. Which of the following statements is true regarding Alzheimer's disease?
    A. Alzheimer's disease is characterized by an abrupt change in memory and functioning.
    B. Alzheimer's disease usually develops as a slow course of deterioration over time.
    C. Naming difficulty is defined as the onset of Alzheimer's disease.
    D. Changes in cognitive functioning affect more than 40% of adults over 65 and are usually precursors of Alzheimer's disease.
    E. C and D

14. Common, reversible causes of impaired cognitive function include all of the following EXCEPT:
    A. Vitamin B12 deficiency
    B. Electrolyte imbalance
    C. Parkinson's disease
    D. Depression
    E. Medications

15. Which of the following would you expect to see in an elderly resident with a diagnosis of Type 2 Diabetes?

A. Glucose found in the urine at lower blood glucose levels than in younger adults.
B. More frequent complaints of thirst than with younger adults.
C. A recent infection, the onset of which often leads to the diagnosis of diabetes.
D. Ketoacidosis, which is common in older adults.
E. All of the above.

16. The effectiveness of the immune system changes with aging. Which of the following statements best describes these changes?
    A. Age-related decreases in some antibody production may partially account for the high incidence of and mortality from pneumonia and influenza.
    B. Changes in T-cells increase the older adult's vulnerability to conditions such as shingles.
    C. 40% of healthy elders may not develop protective immunity after influenza immunizations.
    D. B and C
    E. A, B, and C

17. After interviewing Mrs. Long, you suspect that she may have pneumonia. Since older adults with pneumonia often present with atypical signs and symptoms, you would be especially alert to:
    A. Mental status changes
    B. Loss of appetite and dehydration
    C. Productive cough and high temperature
    D. B and C
    E. A and B

18. Mrs. Parker is an 83 year-old resident in a long-term care facility. She has been immobile for a period of six months since her last stroke. As a result of her immobility she has developed pressure ulcers on her hips as well as early contractures and hypotension upon standing. Other complication(s) of immobility may include:
    A. Malnutrition and constipation
    B. Blood urea nitrogen (BUN) decrease
    C. Loss of muscle function
    D. A, B, and C
    E. A and C

19. Which of the following factors contribute most significantly to the formation of pressure sores?
    A. Malnutrition
    B. Obesity
    C. Sedation
    D. Dehydration
    E. B and C

20. Falls are a common vulnerability for the elderly, and are preventable in many cases. In evaluating your residents' risks for falling you should consider balance, vision, and musculoskeletal strength, and also:
    A. Nutritional status
    B. Cognitive Status and environment
    C. Medications/drugs
    D. A and C
    E. B and C

21. Mrs. Decker died 18 months ago after 42 years of marriage. Mr. Decker, age 76, has remained depressed and frequently mentions that life just isn't the same without his wife. Which of the following trends in our elderly population suggests that Mr. Decker is at risk for suicide?
    A. The risk for suicide is great in the first two years after the loss of a spouse.
    B. Suicide rates continue to rise, particularly for white males 75 years and older.
    C. Because suicide occurs more frequently with persons 65 and older, attention should be given to the symptoms of depression and withdrawal.
    D. A and C
    E. A, B, and C

22. Mr. Baker has metastatic prostate cancer. His family is caring for him at home, but his pain is becoming more intense. Which of the following statements are important for his caretakers to understand about Mr. Baker's pain management?
    A. Because of the common physiologic changes in the elderly, most will respond to analgesics.
    B. If a resident is in constant pain, it is essential that they receive their pain medications regularly in anticipation of the pain.
    C. Side effects from pain medications are more important in the care of metastatic cancer since they may indicate that the pain medication is not appropriate.
    D. Providing a stimulant such as caffeine will not mitigate sedation caused by opiates.
    E. B and D

23. Mr. Miller is a 75 year-old white male who had a stroke two years ago. Today he is complaining of urinary frequency and burning. One of the first things you would want to assess Mr. Miller for is:
    A. Urinary retention status post stroke
    B. Benign prostatic hyperplasia (hypertrophy)
    C. Diabetes mellitus
    D. Renal insufficiency
    E. Prostatitis

24. Which of the following is a myth of aging?
    A. Nutrition, stress, and lifestyle can all affect the aging process.
    B. The basic needs of older people are the same as for younger persons.

C. The aging process will affect sexual activities more than illness or disease.
D. Personality changes are typical.
E. Aging itself is not related to a loss of intelligence.

APPENDIX F

SCENARIO COUNTERBALANCE ORDERS

	Scenario Orders								
Scenario	**Cue(s)**	**Order 1**	**Order 2**	**Order 3**	**Order 4**	**Order 5**	**Order 6**	**Order 7**	**Order 8**
Neutral scenario : Mr./Mrs. Harris sits down for dinner and complains that he/she does not like the entrée being served that evening. [*This scenario will be female for half of the participants, and male for the other half of participants.*]		1	1	1	1	1	1	1	1
While helping Mrs. Brown get undressed, you notice she has wet her pants.	Physical	3	6	5	4	7	5	4	2
Mr. Clark forgets a conversation he had with you from yesterday.	Cognitive	6	4	4	7	2	4	6	5
You notice that Mrs. Anderson is having some difficulty walking and appears to be dizzy.	Physical-Physical	4	3	7	6	4	2	3	7
Mr. Smith is having trouble doing his crossword puzzle. Today he has also had times when what he says does not make a lot of sense, and other times when he seems fine.	Cognitive-Cognitive	5	7	2	2	6	3	7	3
Mrs. Edwards has a cough, and seems to be confused about where she is.	Physical-Cognitive	7	2	3	3	5	6	5	6
You notice that Mr. Johnson is not coming out of his room and he skips out on his regular activities and hobbies.	Behavior-Behavior	2	5	6	5	3	7	2	4

APPENDIX G

CUES CODING SCHEME

Code		
General		
	Decline	
	Sick/Not feeling well	
	Other	
Specific		
	Cognitive	
		Confusion/Not alert
		Forgetting
		Psychotic symptoms
	Physical	
		Abnormal Urine
		Body Movement/Posture
		Breathing
		Decreased appetite
		Difficulty speaking
		Eyes
		Fall
		Lethargy
		Pain
		Skin abnormality/temperature
		Sleep
		Standing up
		Trouble going to bathroom
		Wander/Attempt elopement
		Unresponsive
		Other
	Emotional	
		Combative/Aggressive/Agitated
		Depressed
		Frightened
		Non-compliant
		Unengaged/Subdued/Isolating

APPENDIX H

SUBJECT MATTER EXPERT ONLINE SURVEY

Demographic Information

1. Gender:
   - □ Male
   - □ Female
2. Age: _____
3. What is your current job title?
4. How many years have you been in this position?
5. Could you please describe your relevant experience working with older adults?
6. How many years of experience overall do you have working with older adults in an assisted living/personal care home setting?
7. Please indicate all the certifications, licenses, and degrees that you currently have (choose all that apply).
   - □ Certified Nursing Assistant
   - □ Certified Medication Technician
   - □ Licensed Vocational or Practical Nurse
   - □ Registered Nurse
   - □ Other (please specify) _____
8. Could you please describe any other relevant education and/or training for working with older adults?

Caregiving Scenarios

On the following screens you will be presented with a series of hypothetical scenarios describing a situation with an older adult resident. For each scenario, you will be asked questions about whether you would be concerned about the resident, how you would interpret the situation, and whether you believe any action would need to be taken.

[*Each scenario will be presented and followed by questions 1-4, and this will repeat for each of the 7 scenarios.*]

1. Mr. Harris sits down for dinner and complains that he does not like the entrée being served that evening.
2. While helping Mrs. Brown get undressed, you notice she has wet her pants.
3. Mr. Clark forgets a conversation he had with you from yesterday.
4. You notice that Mrs. Anderson is having some difficulty walking and appears to be dizzy.
5. Mr. Smith is having trouble doing his crossword puzzle. Today he has also had times when what he says does not make a lot of sense, and other times when he seems fine.
6. Mrs. Edwards has a cough, and seems to be confused about where she is.

7. You notice that Mr. Johnson is not coming out of his room and he skips out on his regular activities and hobbies.

1. How serious would your concern for the resident be in this situation?

☐	☐	☐	☐	☐
Not at all serious	Somewhat serious	Moderately serious	Very serious	Extremely serious

2. What are the most likely/typical/common cause(s) for this situation?
3. What are possible, but perhaps less likely causes for this situation?
4. What should a direct caregiver (e.g., certified nurse assistant) do if he/she is in this situation with a resident?

On the following pages, you will see the same set of scenarios. However, now our focus is to understand how important you believe it is for a direct caregiver (e.g., a CNA or resident assistant that you supervise) to engage in several specific actions in response to the situation.

1. For each of the following actions, please rate how necessary you believe this action to be given the present situation:

	Not applicable (Another person's responsibility)	**Not important**	**Somewhat important**	**Very important**	**Essential**
Monitor resident more closely	☐	☐	☐	☐	☐
Inform supervisor/Med. Tech.	☐	☐	☐	☐	☐
Inform family	☐	☐	☐	☐	☐
Contact 911/Send to emergency room	☐	☐	☐	☐	☐

APPENDIX I

MANN-WHITNEY *U* STATISTICS FOR CONCERN RATINGS

	Low Experience		High Experience			
Scenario	Median	Range	Median	Range	*U*	*p*
Dinner Complaint	3.00	2-4	2.50	2-4	20.00	.58
Incontinence	3.00	2-5	3.00	2-4	88.00	.88
Forgotten Conversation	3.00	2-5	3.00	2-4	56.50	.78
Trouble Walking-Dizziness	4.00	4-5	4.50	3-5	116.00	.86
Crossword Trouble-Confused Speech	2.50	2-4	3.00	2-5	80.00	.26
Cough-Confusion	4.00	2-5	3.50	2-5	88.00	.47
Isolation-Withdrawal from Activity	4.00	2-5	3.25	2-5	93.50	.42

APPENDIX J

EXPLANATION CODING SCHEME

Code		
General		
	Aging	
	Health declining/Getting worse	
	Not feeling well/sick	
	Other	
Specific		
	Cognitive/Emotional/Social issue	
		Abuse
		Acting out/want attention
		Confused
		Dementia/Alzheimer's
		Depression
		Forgot/losing memory
		Issue with other person
		Sundowning
		Other
	Physical health issue	
		Allergy
		Arthritis
		Bladder issue
		Bronchitis
		Cold/flu
		Diabetes/Blood sugar
		Fatigue/tired
		Getting up too fast
		Heart attack
		Hypertension/Blood pressure
		Incontinence
		Injury
		Lack of food/water
		Medication related
		Pneumonia
		Stroke
		Urinary tract infection
		Other
	Resident preference not met	
	Other	
Don't know		

APPENDIX K

CHI SQUARE GOODNESS OF FIT TEST STATISTICS

Scenario	χ^2	***df***	***N***	***p***
Dinner Complaint	30.12	1	34	< .001
Incontinence	41.67	1	60	< .001
Forgotten Conversation	5.12	1	33	< .05
Trouble Walking-Dizziness	81.39	1	104	< .001
Crossword Trouble-Confused Speech	41.93	1	67	< .001
Cough-Confusion	44.18	1	66	< .001
Isolation-Withdrawal from Activity	10.00	1	90	< .05

APPENDIX L

CHI SQUARE TESTS OF INDEPENDENCE STATISTICS

Scenario	χ^2	***df***	***N***	***p***
Dinner Complaint	1.03	1	34	.31
Incontinence	2.19	1	60	.14
Forgotten Conversation	.91	1	33	.34
Trouble Walking-Dizziness	.71	1	104	.40
Crossword Trouble-Confused Speech	.01	1	67	.91
Cough-Confusion	1.03	1	66	.31
Isolation-Withdrawal from Activity	.56	1	90	.45

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